

59th annual ratio study compiled from the operating statements and balance sheets submitted by representative members of the printing industry, and computed by RGS Enterprises, Inc., 330-332 East 25th Street, Baltimore, Maryland 21218.

1982 Financial Ratios All Printers by Sales Volume + Management Guide to Using the PIA Ratio Studies

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CERTIFIED PUBLIC ACCOUNTANTS

Offices:
PHILADELPHIA
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Dear Member of the Graphic Arts Community:

Again in 1982, it is our pleasure to present to you PIA's Financial Ratio Studies. This year, a total of 944 firms representing various segments of the graphic arts industry in the United States and Canada participated in these studies by responding to PIA's questionnaire on financial performance. Among these respondents, 238 firms may be considered "Profit Leaders," earning eight percent or greater pretax profits on sales. Such widespread participation has made these annual PIA Ratio Studies the most comprehensive financial reports available on the health of the graphic arts industry.

This book, the first in a series of ten, presents the financial status of graphic arts firms according to sales volume. Ratios and statistics from responding firms are presented in six categories: sales to \$250,000, sales from \$250,000 to \$500,000, sales from \$500,000 to \$1,500,000, sales from \$1,500,000 to \$5,000,000, sales from \$5,000,000 to \$10,000,000, and sales over \$10,000,000. Readers can compare the data from their own firm's financial statements with similar data from other firms having the same sales volume in five areas: Operations based on Value Added and its Supporting Schedules, Operations based on Sales and its Supporting Schedules, Balance Sheet Ratios, Significant Facts, and Return on Investment. This data is accompanied by up-to-date articles on the significance of these financial areas within the graphic arts industry.

We strongly believe in the importance of sharing this type of information among members of the graphic arts community and are proud to have played a role in compiling these studies. Moreover, we commend PIA and its staff for their continuing sponsorship of these studies and for the help that they have so graciously provided in their completion.

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1982 is the 59th consecutive year in which Printing Industries of America, Inc. has collected, compiled and published detailed financial ratio information for members of the graphic arts community. The data presented each year provide a detailed and comprehensive picture of the financial status of the major segments of the graphic arts industries, as well as allowing individual firms to compare their annual performance with that of many other similar firms, including those which earn well above average profits. Ratio results for several different segments of our industry are available in book form. In 1982 these books include:

- All Printers by Sales Volume
+ Management Guide to the Ratios
- All Printers by Product Specialty
- Quick Printers
- Printers by Geographic Area
- Sheetfed Printers, by Size and Geographic Area
- Web Offset Printers, Heatset and Non-heatset
- Book Manufacturers
- Large Printers (over \$10 million in sales)
- Specialists: Typographers
Litho Prep Specialists
- Binders

If you are using the Ratios to analyze your company's performance, it is usually advisable to use the data from at least two of these books as standards of comparison. Such analysis is made much easier by participating in the Studies early each year and ordering an individual company computer printout, which compares a participant's ratios to those of companies which are similar in size, production equipment, markets and other key features. If using only the Ratio books, be careful in comparing your firm's performance to that of the "mixed bag" of printers whose results are summarized in *All Printers by Sales Volume*.

Please refer your questions on the PIA Ratio Studies to your nearest local PIA affiliated association, or to

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HOW THE NUMBERS ARE COMPUTED

The PIA Ratios are computed by the method of relative or common size. With this method each company's dollars are converted into a percentage to the total. Then these percentages are added in total and within a given sales class. This is a very simple way of avoiding what is known as self-weighting when various magnitudes are involved. With this method each company is given equal weight regardless of their size.

The following example illustrates how this calculation process eliminates the problem of the ratios' giving inordinate weight to the results of very large firms.

Firm	Sales	Factory Payroll	% of Sales	
			Firm's Ratio Factory Payroll	PIA Ratio Factory Payroll
A	\$ 200,000	\$ 60,000	30.0%	
B	500,000	100,000	20.0	
C	8,000,000	975,000	12.2	
			62.2% divided by 3 = 20.7%	

Management Guide to Using the PIA Ratio Studies

Harris R. Margolis, CPA

Guide to Higher Profits

PIA's annual Ratio Studies are your guide to higher profits. With them, you can compare your company's financial operations with the financial operations of companies of similar sales volume and determine your standing in the graphic arts community. But, more than that, you can use the hints provided throughout this series to increase your firm's profits. That's the real purpose of these Ratio Studies.

To illustrate how to use these studies in achieving higher profits, we have made up a hypothetical printing company and named it the ABC Company. Below are ABC's Statement of Operations and Balance Sheet. For purposes of this example, we will assume that the ABC Company has an annual sales figure of \$2 million.

Ratios Convert Dollars to Percentages

First of all, note that the ABC Company's financial statements are presented both in dollars and percentages. Dollar figures are always meaningful because printing firms, like all other firms, deal with dollars. Also, financial statements are presented in dollars. The reason for converting dollars to percentages — on total sales, value added, or total assets — is to enable you to compare your financial statements with the PIA Ratio Studies.

In accounting terminology, these percentile statements are called "common size" statements. They permit us to deal, not in dollar amounts, which are different for each firm, but in "common size" statements — each with a base of 100 percent for every firm. In this way, it is easy for you to compare your financial statements, other ratios, and significant facts with the PIA Ratios Standards.

Using the Ratios

The following is a step-by-step procedure for using the PIA Ratios:

1. Prepare your Statement of Operations and Balance Sheet in

dollars and in percentages, as in our example.

2. Compare your percentages in every case with the PIA High Profit Standard in your sales category. These latter figures appear on pages 14 and 24 of this study.
3. Then compare your percentages with the percentages of Profit Leaders in the following areas:
 - Value Added produced by sales
 - Cost of factory labor to produce Value Added
 - Assets committed per employee and, specifically, per factory employee, and gross plant investment per factory employee
 - Percentage breakdown of employees among factory, administrative and sales
 - Sales produced per employee, and sales and Value Added produced per factory employee
 - Sales per salesman
 - Payroll per employee and as a percentage of sales
 - Collection period of receivables
 - Evaluation of the firm's profitability
 - The firm's return on investment.

On the following pages, we will analyze our hypothetical firm's operations as if they were real to us. While some of our conclusions are absolute, others reflect opinions with which you may disagree. The purpose of the Ratio Studies is to provide clues rather than answers. But, if you can use these clues, the probability is high that you can also find solutions to your own specific problems.

STATEMENTS OF OPERATIONS

	ABC COMPANY		PIA HIGH PROFIT STANDARDS (\$1,500,000-\$5,000,000)	DIFFERENCE MORE (LESS)
	DOLLARS	% OF SALES		
SALES OR VALUE OF PRODUCT PRODUCED	\$2,000,000	100.00%	100.00%	—
FACTORY COST OF PRODUCT MATERIAL				
Paper	459,400	22.97	21.95	1.02%
Other chargeable materials	107,800	5.39	4.77	0.62
Outside services	170,400	8.52	8.44	0.08
TOTAL MATERIAL	737,600	36.88	35.16	1.72
FACTORY PAYROLL	540,000	27.00	23.85	3.15
FACTORY EXPENSES	235,600	11.78	11.04	0.74
TOTAL FACTORY COST OF PRODUCT	1,513,200	75.66	70.05	5.61
GROSS PROFIT	486,800	24.34	29.95	(5.61)
ADMINISTRATIVE AND SELLING EXPENSES				
Administrative expenses	193,200	9.66	9.66	0.00
Selling expenses	172,400	8.62	7.66	0.96
TOTAL ADMINISTRATIVE AND SELLING EXPENSES	365,600	18.28	17.32	0.96
INCOME BEFORE INTEREST EXPENSE	121,200	6.06	12.63	(6.57)
Interest expense	43,000	2.15	1.22	0.93
OPERATING INCOME	78,200	3.91	11.41	(7.50)
Other income	15,200	0.76	1.06	(0.30)
INCOME BEFORE INCOME TAXES	93,400	4.67	12.47	(7.80)

Analysis of ABC Company Operations

In the following analysis of the ABC Company, we have converted ABC's dollar figures into a percentage of sales. The PIA High Profit Standards for the Statement of Operations and Supporting Schedules are based on ABC's sales volume, and appear on pages 14, 15, 16, and 17 of this study. We have also used the Significant Facts on pages 20 and 21 to further interpret ABC's operations.

Materials Cost. The figures tell us that the ABC Company is using more paper than is shown in the PIA High Profit Standard.

	<u>ABC</u>	<u>PIA Standard</u>
Paper	22.97%	21.95%

ABC Company is using 1.02 percent more paper. As we will note, and discuss in greater detail below, ABC Company is also using more labor than the industry standard — 27.00 percent vs 23.85 percent, or 3.15 percent more. We could justify the higher paper cost if the company had a correspondingly lower labor cost, but this is not the case. Therefore, we conclude that the company's paper cost is high. Why might this be so? Let's consider the following:

Pricing — The company's selling price may be too low, producing a higher relative paper cost.

Product mix — The company may have a different product mix, in which case the problem would not be in materials but elsewhere.

Higher materials cost — It is possible, but not likely, that the company is paying an excessive amount for materials.

Poor materials costing — All material costs may not be reflected on cost sheets and, therefore, in the company's selling price.

Spoilage/waste — The company may be inadequately costing and pricing for spoilage, and/or have a spoilage/waste proportion which is higher than it should be.

Factory Labor. ABC Company's factory labor cost is 3.15 percent more than the corresponding PIA High Profit Standard. We can assume that this is a problem because there are no compensating amounts in the statement. What are the probable causes of this excess cost?

Is the company paying more for factory labor? Yes. Its payroll per factory employee is \$22,743, compared with \$20,694 in the PIA High Profit Standard. That is \$2,049 more per employee. With higher payroll costs, one would expect more sales and more profit. Unfortunately, that is not the case.

Is the company producing more or less? The company is producing less! Note that sales per factory employee are \$2,000,000 divided by 23 (number of factory employees), or \$86,957. In contrast, the comparable PIA Standard is \$92,607 of sales per factory employee — a difference of \$5,650. High profit companies produce \$2,000,000 of sales with 22 factory employees. This suggests two possibilities: the ABC Company has too many factory employees, or it needs all 23 factory employees but is not producing enough per employee.

Correspondingly, the company's Value Added (sales less materials) per factory employee is substantially lower than PIA Standards — \$54,336 vs \$58,918 or \$4,582 lower.

Factory Expenses. ABC's factory expenses are approximately three-fourths percent higher than those of high profit companies. The problem lies mainly with variable expenses, specifically factory supplies and expense (0.44 percent higher) and repairs and maintenance (0.13 percent more). The questions to ask are: Is there a lack of adequate control? Are sales too low to support all of this overhead?

Selling Expenses. ABC Company's selling expenses are about one percent too high — 8.62 percent vs 7.66 percent, or an actual difference of 0.96 percent. The problem shows up in the following tabulation.

	<u>ABC</u>	<u>PIA Standard</u>	<u>Difference</u>
Salaries	6.06%	5.42%	0.64%
Travel and entertainment	0.93	0.79	0.14
Other selling expenses	1.63	1.45	0.18
			<u>0.96%</u>

The problem here is caused by salaries and other compensation expenses that are excessively high in relation to the company's sales.

Interest Expense/Other Income. There is a 1.23 percent difference in these categories between the ABC Company and the PIA Standard. This is due to a higher interest expense and lower other income.

Interest Expense:	
ABC Company	2.15%
PIA High Profit Standard	<u>1.22</u>
ABC Higher Interest Cost	<u>0.93%</u>
Other Income:	
PIA High Profit Standard	1.06%
ABC Company	<u>0.76</u>
ABC Lower Other Income	<u>0.30%</u>

On \$2,000,000 of sales, the 1.23 percent between ABC's higher interest expense and lower income and the PIA Standard represents \$24,600 of lost profit. It reduces the company's profit by 26 percent, to \$93,400 rather than \$118,000. This is a direct effect of ABC's balance sheet on the statement of operations — the result of having less funds and more debt.

Conclusions. In essence, if the ABC Company is to improve profit, it must find ways to correct:

Pricing
Materials cost
Factory labor
Factory expenses
Administrative and selling expenses

Quality of Operations. ABC had \$2,000,000 in sales and a pretax profit of 4.67 percent, while its counterpart, the High Profit Standard firm, showed a pretax profit of 12.47 percent on the same sales. It seems strange but true that about 2-2/3 times the profit could be realized from the same sales volume:

	<u>Sales</u>	<u>Profit</u>	<u>% of Sales</u>
ABC Company	\$2,000,000	\$ 93,400	4.67%
PIA High Profit Standard	2,000,000	249,400	12.47

Size isn't really that important when considering profits as a percentage of sales; there are companies less than half the size of ABC Company earning approximately the same percentage of pretax profit. In fact, on page 14 under companies with a sales volume of \$250,000 to \$500,000, the profit leaders are achieving a 12.57 percent pretax profit. This supports a well-known principle of business: in a firm's growth, quality should take precedence over quantity.

Summary. Our analysis has, of course, barely scratched the surface. However, it does illustrate how these ratios can help you uncover problems in your company's operation. We urge you to use them. With a diligent commitment, your end result should be an increase in profit as a percentage of sales, and improvement in your return on investment.

BALANCE SHEET**ABC COMPANY**

	<u>DOLLARS</u>	<u>% OF TOTAL ASSETS</u>	<u>PIA HIGH PROFIT STANDARDS (\$1,500,000-\$5,000,000)</u>	<u>DIFFERENCE MORE (LESS)</u>
ASSETS				
CURRENT ASSETS				
Cash	\$ 32,800	6.45%	11.25%	(4.80)%
Receivables	167,500	32.93	29.55	3.38
Inventories	73,800	14.50	14.20	0.30
Other current assets	23,000	4.52	6.17	(1.65)
TOTAL CURRENT ASSETS	<u>297,100</u>	<u>58.40</u>	<u>61.17</u>	<u>(2.77)</u>
FIXED ASSETS				
Real estate	51,100	10.05	10.78	(0.73)
Less: Accumulated depreciation	15,700	3.09	3.24	(0.15)
	<u>35,400</u>	<u>6.96</u>	<u>7.54</u>	<u>(0.58)</u>
Machinery and equipment	307,800	60.49	54.60	5.89
Less: Accumulated depreciation	169,700	33.34	30.83	2.51
	<u>138,100</u>	<u>27.15</u>	<u>23.77</u>	<u>3.38</u>
Other fixed assets	36,900	7.25	7.39	(0.14)
Less: Accumulated depreciation	19,200	3.78	3.95	(0.17)
	<u>17,700</u>	<u>3.47</u>	<u>3.44</u>	<u>0.03</u>
NET FIXED ASSETS	<u>191,200</u>	<u>37.58</u>	<u>34.75</u>	<u>2.83</u>
OTHER ASSETS	<u>20,500</u>	<u>4.02</u>	<u>4.08</u>	<u>(0.06)</u>
TOTAL ASSETS	<u>508,800</u>	<u>100.00</u>	<u>100.00</u>	<u>—</u>
LIABILITIES AND EQUITY				
CURRENT LIABILITIES				
Notes payable	45,400	8.92	5.30	3.62
Accounts payable	70,100	13.78	11.68	2.10
Other current liabilities	53,300	10.48	11.14	(0.66)
TOTAL CURRENT LIABILITIES	<u>168,800</u>	<u>33.18</u>	<u>28.12</u>	<u>5.06</u>
LONG-TERM LIABILITIES	<u>129,800</u>	<u>25.51</u>	<u>18.39</u>	<u>7.12</u>
TOTAL LIABILITIES	<u>298,600</u>	<u>58.69</u>	<u>46.51</u>	<u>12.18</u>
SHAREHOLDERS' AND PROPRIETORS' EQUITY	<u>210,200</u>	<u>41.31</u>	<u>53.49</u>	<u>(12.18)</u>
TOTAL LIABILITIES AND EQUITY	<u>508,800</u>	<u>100.00</u>	<u>100.00</u>	<u>—</u>

Balance Sheet Analysis

In comparing ABC's balance sheet ratios with the PIA High Profit Standard, the most significant revelation is ABC's debt. Its current debt of \$168,800, or 33.18 percent, is 5.06 percent higher than the High Profit Standard of 28.12 percent. That means that ABC Company has about \$25,700 more debt than is standard for high profit companies.

Furthermore, the standard tells us that ABC's problem is not just one of current debt, but also of long-term debt. The standard long-term debt is 7.12 percent lower than is ABC's long-term debt or, in absolute numbers, \$36,000 less.

As a result, ABC's managers are funding the company with a 58.69 percent debt vs a debt of 46.51 percent for the High Profit firms in our study.

What is the company's *current ratio*? This is figured as:

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{\$297,100}{\$168,800} = 1.76$$

In contrast to ABC's ratio of 1.76, the High Profit current ratio is 2.18. ABC's current ratio is too low and instead, should be about 2.00. At the same time, however, it appears that the High Profit Standard may be slightly high. Why?

In ABC's case, the company needs more profit, more retention of earnings, and a lower *debt to equity ratio*. This ratio is:

$$\frac{\text{Debt}}{\text{Equity}} = \frac{\$298,600}{\$210,200} = 1.42$$

Value Added

ABC's Value Added is:

Sales	\$2,000,000
Materials and Outside Services	737,600
Value Added	<u>\$1,262,400</u>

The \$1,262,400 is the value of ABC Company's own manufacture, or "inside sales." What is the factory labor cost as a percentage of this value added?

$$\frac{\text{Factory labor}}{\text{Value Added}} = \frac{\$540,000}{\$1,262,400} = 42.78\%$$

Note that the comparable High Profit Standard for factory labor is 36.78 percent. According to this standard, only \$464,300 of factory labor (rather than \$540,000) should have been incurred to produce a Value Added of \$1,262,400. PIA High Profit firms produced \$1,468,000 of Value Added with the same labor cost.

The Company's objective should be to increase Value Added, while improving, by lowering, the ratio of factory labor to Value Added.

Assets Committed Per Employee

	ABC	PIA High Profit Standard	Dif- ference
Assets per employee	\$31,575	\$35,793	\$4,218
Assets per factory employee	48,440	51,610	3,170

These figures show that ABC is not employing sufficient assets. There is a truism that goes, "It takes money to make money." It is also true that companies with higher profits invest more assets in their employees. This is a particular characteristic of capital intensity.

If ABC is to improve its profit as a percentage of sales and achieve a ratio similar to the PIA High Profit Standard, it must improve these statistics, i.e., assets per employee and assets per factory employee. This is the complement of balance sheet improvement.

The Anatomy of ABC Company

Employees	ABC	PIA High Profit Standard
Factory	23.9	22.1
Administrative	4.3	4.0
Selling	3.8	3.3
Total employees to produce \$2,000,000 of sales	<u>32.0</u>	<u>29.4</u>

The most significant difference here is that ABC has 1.8 more factory employees than the standard. Throughout our analysis, the PIA ratios tell us that ABC is not as productively efficient as High Profit firms. This is another indication that it is using more factory labor for the same production that High Profit firms achieve.

Payroll as a Percentage of Sales

ABC's total payroll as a percentage of sales is 39.87 percent. Compared with the High Profit Standard of 36.21 percent, there is a difference of 3.66 percent — over three-fourths of ABC's total profit. This figure includes all payroll (factory, administrative and sales) and related payroll expenses.

From our review of Significant Facts in the payroll classification, it appears that there is only one variance that merits investigation — the 3.66 percent difference in payroll from that of the standard.

ABC spent \$0.88 per year in factory payroll for every dollar of plant equipment used (gross before depreciation). In contrast, by the standard, \$0.89 should be spent in plant labor for each dollar of factory assets employed. Although this is not a significant difference, it would be misleading to conclude that this performance characteristic of High Profit companies is attributable only to their greater amount of equipment. While equipment is certainly a factor, one must also consider return on investment and mark-up procedures when the capital proportion of cost increases.

Collection Period of Receivables

ABC Company's collection period of receivables is 58.6 days — only slightly higher than the PIA High Profit Standard of 54.3 days. While this average is indicative of fair collection and credit procedures and a clue to a satisfactory customer list, better business judgment indicates that improvements still can and should be made in this area.

Evaluation of Profitability

ABC's 4.67 percent profit is inadequate when the company produces only an 8.66 percent return on investment. Moreover, its pretax profit is 7.80 percent below the PIA High Profit Standard for companies with similar sales volume. Most of this difference stems from a gross profit which is 5.61 percent less than the standard.

Return on Investment

The company's return on investment was 8.66 percent compared with the High Profit Standard of 18.06 percent. Its investment turnover was 142.86 percent, which is almost equal to the standard of 142.36 percent. Thus, ABC (and the profit leaders also) received \$1.43 of sales per dollar of gross assets.

Generally speaking this is good, but the company's very poor income before interest, other income, and taxes obviously is still inadequate to produce a satisfactory return on investment. In other words, ABC's profit does not provide an adequate return on investment.

Effectively Managing Today for Tomorrow

Economic conditions continue to force business managers to seize tighter control of their costing and pricing strategies. Even though recent industrial trends show large printers relatively unaffected by recessionary pressures, the majority of medium to small size printing firms have not been as fortunate. These firms continue to be ravaged by both inflationary and recessionary elements. Printing managers should take hold of this situation by employing updated costing and pricing strategies.

Replacement Costs

The average printer is spending approximately 36 percent of sales on material. Printers cannot use yesterday's costs to determine today's pricing. Yet, while this simple statement may sound obvious, the fact remains that the majority of printers do calculate prices based on outdated costs.

With costs continuously changing, printers must be ready, at all times, to update their costing and pricing systems. Furthermore, to price jobs profitably they must be able to anticipate what those cost increases will be. Herein lies the problem for many printers. With material and supply costs increasing at a fast pace, determining exact figures for these costing components proves difficult. The NIFO (Next-In, First-Out) method for material costing insures that a printing firm's costs for a job will be reported so as to allow for adequate funds to replace the goods used to produce the work.

Using the NIFO method, if you were costing a job which required paper purchased at 43 cents per pound; film at \$1 per sheet; and plates at \$5, you would look ahead to what the replacement cost of these materials will be before you cost and price the work. If today's prices indicate that paper has jumped to 48 cents; film to \$1.50; and plates to \$5.50, then these are the figures you would use to calculate both costs and final price.

Pricing and Costing Utilizing Replacement Values

Original Purchase Price	Current Price To Replace
Paper @ \$0.43/lb.	\$0.48
Film @ \$1.00	\$1.50
Plates @ \$5.00	\$5.50

According to NIFO, you cost and price at:

Paper	Film	Plates
\$0.48	\$1.50	\$5.50

Remember, the purpose of your cost and accounting system is to give you a clear picture of the ongoing financial operations of your business. The more accurate this picture is, the more intelligently you can price your printed product. Any system that does not provide for the replacement of materials and supplies will dig directly into your profits on the job.

Updated Hourly Cost Rates

Another factor with tremendous impact on costing and pricing is hourly cost rates. These production cost calculations must be scrutinized at increasingly close intervals as your costs of doing business climb.

Since the foundation of budgeted hourly rates is an analysis of current operating expenses and anticipation of increased expenses, profitable and competitive rates need to be continuously updated to compensate for present economic woes. The old theory of determining hourly costs once a year can be thrown out the window. Under today's inflation rate, your hourly rates should be calculated on a quarterly basis in order to reflect true operating costs.

Increased Productivity

Although increasing costs are a fact of life for today's printers, correspondingly increasing prices are not. The prime weapon graphic arts firms have to battle inflation with is productivity. Printers should take a close look at how improving productivity will lower the cost per unit and thus offset the devastating effects of inflation. Innovations are available in both management and technology that can give a big boost to productivity. Printers who do not keep pace with these innovations may well find higher costs driving them out of competition.

If your cost per hour of production is, say, \$40 and you produce 5,000 units per hour, then your costs are \$8 for each 1,000 units. Operating under 13 percent inflation for a period of three years, these same 5,000 units would cost \$57.72 per hour, and total \$11.54 per 1,000 units. (See illustration below.) This \$3.54 per thousand increase may bump a printer out of the competitive market.

Assuming cost per hour cannot be changed, a graphic arts firm may well be stuck with the higher \$57.72 cost per hour figure. But units produced can be improved. It is a rare (or not truthful) printer who can honestly say he cannot increase units produced per hour. In our example, a 2,215 boost in units produced each hour would lower the cost per unit back to the original \$8 per thousand. Even though this entire increase may be unachievable, it is remarkable how much productivity can be increased if you set your goal and keep to it.

Increased Productivity Keeps Cost Per Unit Down

	Cost Per Hour (\$'s)	Units Produced (Per Hour)	Cost Per Unit (\$'s/M)
Base	40.00	5,000	8.00
13% Increase Per Year for Three Years	57.72	5,000	11.54
Objective to INCREASE Units Produced	57.72	7,215	8.00

To implement this increase in units produced per hour may involve the purchase of new technology, a production improvement program, or merely an investment in higher quality materials. But often the increase can be instituted without any added capital at all.

Printers today must be ready to investigate all and any avenues available that might lead to increased productivity. By doing so, they will be better prepared to offset the potentially crippling effects of inflation. Tighter controls must be maintained in all aspects of the business. Accounting systems must insure that all costs are reported and that costs and prices are geared to the continuation of healthy operations. Printing managers can effectively manage today for tomorrow.

Value Added — What It Means to You

Statements of Operations and Supporting Schedules, based on *Value Added* rather than sales dollars, appear on pages 10, 11, 12 and 13 of this study. This discussion of Value Added should be related to that material and not to the Statements of Operations and Supporting Schedules which are on pages 14, 15, 16 and 17.

Value Added Defined

Value Added is simply your *sales less material costs*, which include paper, other chargeable materials and outside services. Value Added is, therefore, that component of a sale attributable to your own manufacture. It is calculated as follows:

Sales		\$100 00
Less Materials:		
Paper	\$23.03	
Other chargeable materials	5.38	
Outside services	8.03	36.44
Value Added		<u>\$ 63.56</u>

Other chargeable materials include ink, film, plates, etc., but not general supplies, such as repair or maintenance parts. Outside services are purchases of job-related services — composition, offset preparation, printing, bindery, etc.

Known By Other Terms

Value Added is also known by such other terms as *inside sales*, *conversion value*, *inside manufacturing value* and *real contribution to overhead and profit*. Whatever the term, the concept of Value Added is of prime importance to the profitability of your operations.

Conceptual Understanding of Value Added

Once you observe that Value Added is the residual of sales less material costs, you realize that this value provided by your own manufacture is all you have available to pay your remaining expenses. These are:

- Factory labor
- Other factory expenses
- Administrative expenses
- Selling expenses
- Interest

And then, what is left is a profit. This is different than the basic "cost sheet concept" that we are accustomed to in the printing industry.

And since, generally, within a relevant range of operations, these expenses behave as fixed costs, the "overhead" represented by these expenses will remain practically constant. Therefore, you want to **maximize your Value Added**.

Let us illustrate this with the following example, in which we are increasing the Value Added derived from \$1,000,000 of sales from \$635,600 to \$675,000 to see the effect on operating income. We will assume that "overhead" (factory labor; other factory, administrative, selling and interest expenses) will remain the same.

The assumption that these expenses will not increase is being taken with some license; actually they would increase, but very little. We are taking this liberty to prove the point that, within this relevant range, these expenses behave in a fixed manner. This helps to understand the effect of Value Added on profit.

	Original	After Increase in Value Added
SALES	\$1,000,000	
Material Costs	364,400	
VALUE ADDED	635,600	\$675,000
"Overhead"	591,000	591,000
Operating Income	<u>\$ 44,600</u>	<u>\$ 84,000</u>

Statement of Operations — Value Added: The Better Statement

By eliminating the distortion that material costs introduce into the conventional operating statement, Value Added gives you a truer picture of your operations.

For example, if we were comparing the statement of operations of a short-run, sheet-fed company with that of a web-offset firm, and our comparison was related to percentages based on sales, we could have significant differences in ratios. The reason: the significant differences in material costs. It would appear that the web-offset operation had a lower factory labor cost because a substantial amount of the sale was materials. But, in truth, the factory labor cost could be more or less than in its counterpart sheet-fed operation as it relates to the Value Added produced by this labor.

Almost every company's product mix is different and, by using statements of operations based on Value Added, this product mix difference is eliminated. In conclusion, **the Statement of Operations — Value Added is a better statement with which to evaluate your operations.**

Selling Value Added

The importance of Value Added to you lies in the basic fact that your eventual profit (after all expenses are paid) is derived from sales of your own manufacture. Your overhead is not met by selling materials, but rather by the manufacturing in your plant.

True, most sales are desirable. But sales that are heavy in materials are less desirable because they contribute less to pay your fixed overhead, which must be covered first before there is any net profit. The sale that is mostly your in-house labor is better because it contributes more to cover fixed overhead. As you can see, the faster your overhead is met by Value Added, the sooner the excess appears as profit. This is an oversimplification, but it serves to emphasize that what we really want and need are those sales with the most Value Added.

Your management concept is to maximize Value Added through the following:

- Manufacturing policies
- Purchasing controls
- Target markets and sales
- Salesmen's compensation which complements this objective
- Others

Mark-Ups for Cost and Profit

Understanding the Value Added concept permits focusing on the mark-up of materials for recovery of its share of overhead. It is essential that materials be priced at their cost plus their proper share of the allocated overhead. As Value Added is so important, it is imperative that the overhead recovered by materials be correct. The trite 5, 10 or 15% mark-up of materials (so-called handling charges) may or may not be correct. You should determine as a cost-center cost the correct overhead rate to be charged to materials. This is just as important as the correct press hourly rate.

Once this is done, you are looking at a cost sheet that contains materials with their share of overhead and cost-center costs. And now, you must apply the concept of profit mark-up. This will differ as the relationship of materials and manufacturing changes.

Report on Operations—Value Added=100%

	ALL FIRMS REPORTING		SALES TO \$250,000		SALES FROM \$250,000-\$500,000	
	ALL FIRMS	PROFIT LEADERS*	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
SALES OR VALUE OF PRODUCT PRODUCED	X	X	X	X	X	X
LESS: PAPER, OTHER CHARGEABLE MATERIALS AND OUTSIDE SERVICES	X	X	X	X	X	X
VALUE ADDED BY MANUFACTURE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
FACTORY PAYROLL	42.84	38.39	41.03	32.30	41.58	42.00
FACTORY EXPENSES	19.63	17.90	24.20	24.44	21.61	18.79
TOTAL FACTORY COST OF PRODUCT	62.47	56.29	65.23	56.74	63.19	60.79
GROSS PROFIT	37.53	43.71	34.77	43.26	36.81	39.21
ADMINISTRATIVE AND SELLING EXPENSES						
Administrative expenses	15.93	13.93	17.31	12.77	20.63	15.34
Selling expenses	12.26	10.84	7.90	5.74	8.41	6.87
TOTAL ADMINISTRATIVE AND SELLING EXPENSES	28.19	24.77	25.21	18.51	29.04	22.21
INCOME BEFORE INTEREST EXPENSE	9.34	18.94	9.56	24.75	7.77	17.00
Interest expense	3.31	2.20	3.73	3.31	3.16	1.83
OPERATING INCOME	6.03	16.74	5.83	21.44	4.61	15.17
Other income	1.38	2.21	1.48	0.25	1.19	3.45
INCOME BEFORE INCOME TAXES	7.41	18.95	7.31	21.69	5.80	18.62

* See Page 14 for the definition of Profit Leaders.

SALES FROM \$500,000-\$1,500,000		SALES FROM \$1,500,000-\$5,000,000		SALES FROM \$5,000,000-\$10,000,000		SALES OVER \$10,000,000	
ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X
100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
40.89 19.23	37.70 16.19	42.87 18.66	36.73 16.99	44.87 19.56	38.78 17.86	46.79 20.09	42.47 18.87
60.12	53.89	61.53	53.72	64.43	56.64	66.88	61.34
39.88	46.11	38.47	46.28	35.57	43.36	33.12	38.66
19.18 12.32	17.52 11.00	15.26 13.67	14.85 11.81	12.32 14.23	12.39 13.95	10.00 10.58	8.34 10.02
31.50	28.52	28.93	26.66	26.55	26.34	20.58	18.36
8.38 3.12	17.59 1.95	9.54 3.45	19.62 1.95	9.02 3.26	17.02 2.43	12.54 3.33	20.30 2.57
5.26 1.40	15.64 2.24	6.09 1.25	17.67 1.68	5.76 1.95	14.59 3.58	9.21 1.28	17.73 1.76
6.66	17.88	7.34	19.35	7.71	18.17	10.49	19.49

Supporting Schedules—Value Added=100%

	ALL FIRMS REPORTING		SALES TO \$250,000		SALES FROM \$250,000-\$500,000	
	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
FACTORY PAYROLL						
Salaries — executive	3.21%	3.20%	7.79%	5.46%	3.80%	4.93%
Direct wages	28.40	25.29	24.95	18.26	27.72	28.39
General factory salaries and wages	4.50	4.14	4.24	5.46	4.62	3.49
Packing, shipping and delivery wages	1.33	1.06	0.27	0.12	0.97	0.84
Payroll taxes	2.52	1.98	2.60	1.78	2.63	2.53
Employee benefits	2.88	2.72	1.18	1.22	1.84	1.82
TOTAL FACTORY PAYROLL	42.84	38.39	41.03	32.30	41.58	42.00
FACTORY EXPENSES						
Fixed Expenses						
Depreciation — real estate	0.41	0.37	0.36	0.52	0.41	0.39
Depreciation — other	4.46	4.47	5.38	6.02	5.03	4.07
Taxes — real estate	0.31	0.31	0.18	0.04	0.21	0.17
Taxes — other	0.29	0.26	0.34	0.44	0.37	0.45
Insurance	0.89	0.76	1.62	1.46	1.41	1.55
Building rent	2.36	2.10	4.85	4.93	3.93	2.70
Utilities — heat, light, etc.	1.76	1.56	1.90	1.69	1.94	1.72
Equipment rental	1.12	0.98	4.28	5.54	1.54	1.01
Total Fixed Expenses	11.60	10.81	18.91	20.64	14.84	12.06
Other Expenses						
Factory supplies and expense	3.11	2.68	1.49	1.13	2.17	2.27
Packing, shipping and delivery expense	1.71	1.64	1.08	0.89	1.79	1.66
Repairs and maintenance	2.09	1.83	2.03	1.25	1.98	1.73
Other factory expenses	1.12	0.94	0.69	0.53	0.83	1.07
Total Other Expenses	8.03	7.09	5.29	3.80	6.77	6.73
TOTAL FACTORY EXPENSES	19.63	17.90	24.20	24.44	21.61	18.79
ADMINISTRATIVE EXPENSES						
Salaries — executive	4.82	4.29	4.82	2.58	7.51	5.62
Salaries — office	4.01	3.43	4.47	3.75	4.95	3.39
Payroll taxes	0.54	0.38	0.46	0.28	0.88	0.45
Employee benefits	0.81	0.71	0.41	0.14	0.73	0.43
Bad debts	0.65	0.50	0.61	0.68	0.70	0.22
Office supplies and expenses	0.80	0.73	1.13	1.08	0.93	0.91
Professional fees	0.91	0.85	1.18	1.11	1.23	1.14
Taxes — business	0.30	0.27	0.31	0.51	0.33	0.22
Telephone	0.77	0.67	1.47	0.99	1.06	0.90
Other administrative expenses	2.32	2.10	2.45	1.65	2.31	2.06
TOTAL ADMINISTRATIVE EXPENSES	15.93	13.93	17.31	12.77	20.63	15.34
SELLING EXPENSES						
Salaries — executive	2.03	2.02	2.42	1.31	1.95	1.38
Salaries and commissions — salesmen	5.33	4.47	0.77	0.29	2.18	1.43
Salaries — sales office clerical	0.89	0.84	0.40	0.35	0.61	0.84
Payroll taxes	0.40	0.30	0.18	0.06	0.29	0.24
Employee benefits	0.46	0.43	0.11	0.12	0.19	0.15
Advertising	0.73	0.68	1.71	1.89	1.14	0.72
Travel and entertainment	1.41	1.15	1.94	0.96	1.37	1.17
Other selling expenses	1.01	0.95	0.37	0.76	0.68	0.94
TOTAL SELLING EXPENSES	12.26	10.84	7.90	5.74	8.41	6.87

**SALES FROM
\$500,000-\$1,500,000**

ALL FIRMS	PROFIT LEADERS
3.18%	3.28%
27.75	25.03
4.19	4.80
1.21	0.92
2.39	1.84
2.17	1.83
40.89	37.70

**SALES FROM
\$1,500,000-\$5,000,000**

ALL FIRMS	PROFIT LEADERS
2.87%	2.83%
28.65	24.77
4.43	3.72
1.46	1.25
2.50	1.88
2.96	2.28
42.87	36.73

**SALES FROM
\$5,000,000-\$10,000,000**

ALL FIRMS	PROFIT LEADERS
2.72%	2.64%
29.98	25.69
4.26	3.57
1.58	1.31
2.61	1.91
3.72	3.66
44.87	38.78

**SALES OVER
\$10,000,000**

ALL FIRMS	PROFIT LEADERS
2.47%	2.39%
29.27	27.07
5.75	4.65
1.67	1.13
2.68	2.16
4.95	5.07
46.79	42.47

0.39	0.33
4.14	4.21
0.31	0.34
0.26	0.22
1.07	0.79
2.95	2.21
1.56	1.27
1.26	0.86
11.94	10.23

0.37	0.33
4.45	4.35
0.29	0.26
0.27	0.20
0.77	0.73
2.00	2.18
1.60	1.26
0.86	0.70
10.61	10.01

0.53	0.41
4.38	4.37
0.39	0.42
0.34	0.25
0.59	0.48
1.39	1.39
1.97	1.75
0.44	0.22
10.03	9.29

0.51	0.41
4.44	4.74
0.40	0.47
0.27	0.25
0.41	0.29
0.86	1.00
2.29	2.20
0.65	0.63
9.83	9.99

2.66	2.23
1.75	1.30
1.91	1.79
0.97	0.64
7.29	5.96
19.23	16.19

3.35	2.58
1.59	1.76
2.00	1.72
1.11	0.92
8.05	6.98
18.66	16.99

3.80	3.58
1.84	2.20
2.35	1.83
1.54	0.96
9.53	8.57
19.56	17.86

4.07	3.48
2.11	1.53
2.63	2.44
1.45	1.43
10.26	8.88
20.09	18.87

6.29	6.25
4.81	4.52
0.70	0.46
0.87	0.64
0.75	0.73
0.97	0.90
0.95	0.93
0.38	0.24
0.80	0.74
2.66	2.11
19.18	17.52

4.43	4.53
4.00	3.94
0.50	0.47
0.91	0.90
0.57	0.43
0.79	0.75
0.88	0.83
0.31	0.35
0.70	0.65
2.17	2.00
15.26	14.85

3.28	3.48
2.77	2.37
0.34	0.26
0.77	0.86
0.66	0.46
0.57	0.60
0.77	0.75
0.22	0.15
0.65	0.58
2.29	2.88
12.32	12.39

1.96	1.88
2.58	1.92
0.29	0.22
0.66	0.64
0.63	0.48
0.48	0.35
0.68	0.59
0.16	0.17
0.51	0.41
2.05	1.68
10.00	8.34

2.62	3.42
4.92	3.58
0.68	0.59
0.44	0.32
0.42	0.30
0.84	0.63
1.43	1.28
0.97	0.88
12.32	11.00

1.94	1.87
6.71	5.82
0.95	0.67
0.46	0.36
0.50	0.44
0.60	0.61
1.47	1.22
1.04	0.82
13.67	11.81

1.85	2.22
6.85	6.37
1.27	1.59
0.45	0.36
0.68	0.75
0.52	0.59
1.33	1.20
1.28	0.87
14.23	13.95

1.07	0.92
4.75	4.62
1.21	0.93
0.27	0.22
0.55	0.57
0.42	0.43
1.07	0.85
1.24	1.48
10.58	10.02

Report on Operations—Sales=100%

	ALL FIRMS REPORTING		SALES TO \$250,000		SALES FROM \$250,000-\$500,000	
	ALL FIRMS	PROFIT LEADERS*	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
SALES OR VALUE OF PRODUCT PRODUCED	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
FACTORY COST OF PRODUCT MATERIAL						
Paper	22.93	21.89	21.03	18.66	21.38	20.51
Other chargeable materials	5.52	5.30	4.44	3.71	4.61	2.97
Outside services	7.99	7.73	7.80	6.08	7.55	8.22
TOTAL MATERIAL	36.44	34.92	33.27	28.45	33.54	31.70
FACTORY PAYROLL	27.15	24.97	27.21	23.39	27.62	28.72
FACTORY EXPENSES	12.49	11.71	16.28	17.82	14.33	12.87
TOTAL FACTORY COST OF PRODUCT	76.08	71.60	76.76	69.66	75.49	73.29
GROSS PROFIT	23.92	28.40	23.24	30.34	24.51	26.71
ADMINISTRATIVE AND SELLING EXPENSES						
Administrative expenses	10.20	9.16	11.34	8.95	13.56	10.60
Selling expenses	7.76	7.07	5.14	4.00	5.59	4.70
TOTAL ADMINISTRATIVE AND SELLING EXPENSES	17.96	16.23	16.48	12.95	19.15	15.30
INCOME BEFORE INTEREST EXPENSE	5.96	12.17	6.76	17.39	5.36	11.41
Interest expense	2.07	1.38	2.53	2.40	2.06	1.23
OPERATING INCOME	3.89	10.79	4.23	14.99	3.30	10.18
Other income	0.84	1.36	1.05	0.18	0.73	2.39
INCOME BEFORE INCOME TAXES	4.73	12.15	5.28	15.17	4.03	12.57

Supporting Schedules—Sales=100%

OTHER CHARGEABLE MATERIALS						
Ink	1.71%	1.80%	1.05%	0.89%	0.79%	0.43%
Film	1.16	1.07	1.05	0.93	0.94	0.58
Plates	1.26	1.08	1.69	1.16	1.00	0.72
Other chargeable materials	1.39	1.35	0.65	0.73	1.88	1.24
TOTAL OTHER CHARGEABLE MATERIALS	5.52	5.30	4.44	3.71	4.61	2.97
OUTSIDE SERVICES						
Composition	0.98	0.82	1.58	1.03	0.79	0.91
Offset preparation	1.36	1.49	0.66	0.22	0.92	0.87
Printing	2.13	2.38	3.31	4.04	3.88	4.48
Binding	1.84	1.85	0.58	0.40	1.21	1.72
Other outside services	1.68	1.19	1.67	0.39	0.75	0.24
TOTAL OUTSIDE SERVICES	7.99	7.73	7.80	6.08	7.55	8.22

*"Profit Leaders" are those firms which earned 8% or greater pretax profits on sales.

**SALES FROM
\$500,000-\$1,500,000**

ALL FIRMS PROFIT LEADERS

100.00% 100.00%

20.59 19.88
4.82 4.82
8.40 8.64

33.81 33.34

27.12 25.18

12.83 10.88

73.76 69.40

26.24 30.60

**SALES FROM
\$1,500,000-\$5,000,000**

ALL FIRMS PROFIT LEADERS

100.00% 100.00%

22.97 21.95
5.39 4.77
8.52 8.44

36.88 35.16

27.00 23.85

11.78 11.04

75.66 70.05

24.34 29.95

**SALES FROM
\$5,000,000-\$10,000,000**

ALL FIRMS PROFIT LEADERS

100.00% 100.00%

25.05 23.03
6.01 5.50
8.31 8.05

39.37 36.58

27.09 24.40

11.74 11.34

78.20 72.32

21.80 27.68

**SALES OVER
\$10,000,000**

ALL FIRMS PROFIT LEADERS

100.00% 100.00%

28.00 25.58
8.23 9.01
5.33 5.03

41.56 39.62

27.35 25.78

11.66 11.30

80.57 76.70

19.43 23.30

12.73 11.64
8.06 7.34

9.66 9.66
8.62 7.66

7.39 7.92
8.74 9.11

5.93 5.20
6.26 6.16

20.79 18.98
5.45 11.62
2.04 1.30

18.28 17.32
6.06 12.63
2.15 1.22

16.13 17.03
5.67 10.65
1.93 1.44

12.19 11.36
7.24 11.94
1.83 1.43

3.41 10.32
0.91 1.44

3.91 11.41
0.76 1.06

3.74 9.21
1.10 1.93

5.41 10.51
0.72 1.06

4.32 11.76

4.67 12.47

4.84 11.14

6.13 11.57

0.95% 1.08%
1.19 1.53
1.24 0.95
1.44 1.26

1.47% 1.26%
1.27 1.18
1.33 1.14
1.32 1.19

2.15% 1.53%
1.15 0.90
1.27 1.33
1.44 1.74

4.67% 5.23%
0.98 1.04
1.26 1.07
1.32 1.67

4.82 4.82

5.39 4.77

6.01 5.50

8.23 9.01

1.35 1.24
1.08 1.58
3.22 3.89
1.37 0.93
1.38 1.00

1.04 0.91
1.65 1.98
1.72 1.89
2.24 2.46
1.87 1.20

0.57 0.74
1.90 1.94
1.02 1.26
2.63 2.71
2.19 1.40

0.23 0.09
0.95 0.83
0.73 0.69
1.54 1.58
1.88 1.84

8.40 8.64

8.52 8.44

8.31 8.05

5.33 5.03

Supporting Schedules—Sales=100%

	ALL FIRMS REPORTING		SALES TO \$250,000		SALES FROM \$250,000-\$500,000	
	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
FACTORY PAYROLL						
Salaries — executive	2.06%	2.11%	5.24%	4.08%	2.53%	3.36%
Direct wages	17.97	16.38	16.74	13.47	18.30	19.25
General factory salaries and wages	2.87	2.73	2.56	3.59	3.13	2.51
Packing, shipping and delivery wages	0.83	0.68	0.19	0.09	0.65	0.58
Payroll taxes	1.60	1.31	1.69	1.26	1.77	1.75
Employee benefits	1.82	1.76	0.79	0.90	1.24	1.27
TOTAL FACTORY PAYROLL	27.15	24.97	27.21	23.39	27.62	28.72
FACTORY EXPENSES						
Fixed Expenses						
Depreciation — real estate	0.26	0.24	0.25	0.37	0.28	0.25
Depreciation — other	2.81	2.86	3.52	4.29	3.27	2.78
Taxes — real estate	0.19	0.20	0.12	0.02	0.14	0.11
Taxes — other	0.18	0.17	0.22	0.29	0.23	0.31
Insurance	0.57	0.50	1.06	1.03	0.92	1.05
Building rent	1.53	1.40	3.23	3.55	2.61	1.87
Utilities — heat, light, etc.	1.11	1.01	1.27	1.21	1.28	1.18
Equipment rental	0.76	0.71	3.10	4.31	1.06	0.72
Total Fixed Expenses	7.41	7.09	12.77	15.07	9.79	8.27
Other Expenses						
Factory supplies and expense	1.96	1.74	0.98	0.80	1.48	1.58
Packing, shipping and delivery expense	1.09	1.07	0.73	0.63	1.19	1.15
Repairs and maintenance	1.32	1.19	1.33	0.89	1.33	1.18
Other factory expenses	0.71	0.62	0.47	0.43	0.54	0.69
Total Other Expenses	5.08	4.62	3.51	2.75	4.54	4.60
TOTAL FACTORY EXPENSES	12.49	11.71	16.28	17.82	14.33	12.87
ADMINISTRATIVE EXPENSES						
Salaries — executive	3.10	2.83	3.17	1.80	4.97	3.91
Salaries — office	2.57	2.25	2.95	2.63	3.27	2.32
Payroll taxes	0.35	0.25	0.29	0.19	0.56	0.31
Employee benefits	0.52	0.47	0.24	0.09	0.49	0.30
Bad debts	0.40	0.33	0.40	0.51	0.43	0.15
Office supplies and expenses	0.51	0.48	0.74	0.77	0.61	0.62
Professional fees	0.58	0.56	0.77	0.78	0.80	0.78
Taxes — business	0.19	0.18	0.21	0.34	0.22	0.16
Telephone	0.49	0.44	0.93	0.71	0.69	0.62
Other administrative expenses	1.49	1.37	1.64	1.13	1.52	1.43
TOTAL ADMINISTRATIVE EXPENSES	10.20	9.16	11.34	8.95	13.56	10.60
SELLING EXPENSES						
Salaries — executive	1.30	1.31	1.60	0.94	1.27	0.94
Salaries and commissions — salesmen	3.34	2.90	0.51	0.20	1.47	1.01
Salaries — sales office clerical	0.57	0.56	0.29	0.23	0.43	0.58
Payroll taxes	0.26	0.20	0.11	0.04	0.20	0.17
Employee benefits	0.29	0.28	0.07	0.08	0.13	0.11
Advertising	0.48	0.45	1.16	1.36	0.77	0.49
Travel and entertainment	0.89	0.75	1.16	0.64	0.89	0.78
Other selling expenses	0.63	0.62	0.24	0.51	0.43	0.62
TOTAL SELLING EXPENSES	7.76	7.07	5.14	4.00	5.59	4.70

SALES FROM \$500,000-\$1,500,000		SALES FROM \$1,500,000-\$5,000,000		SALES FROM \$5,000,000-\$10,000,000		SALES OVER \$10,000,000	
ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
2.11%	2.17%	1.81%	1.82%	1.63%	1.66%	1.45%	1.45%
18.40	16.88	17.96	15.90	18.13	16.10	17.01	16.31
2.77	3.07	2.86	2.56	2.56	2.33	3.39	2.87
0.80	0.57	0.92	0.83	0.94	0.81	0.95	0.68
1.58	1.23	1.58	1.24	1.59	1.23	1.58	1.36
1.46	1.26	1.87	1.50	2.24	2.27	2.97	3.11
27.12	25.18	27.00	23.85	27.09	24.40	27.35	25.78
0.26	0.23	0.23	0.21	0.32	0.26	0.30	0.25
2.74	2.77	2.79	2.76	2.57	2.71	2.54	2.82
0.21	0.24	0.19	0.17	0.24	0.26	0.23	0.26
0.17	0.15	0.17	0.13	0.20	0.16	0.17	0.16
0.70	0.53	0.49	0.48	0.35	0.29	0.24	0.17
1.96	1.48	1.26	1.42	0.82	0.87	0.50	0.62
1.03	0.85	1.01	0.82	1.18	1.10	1.34	1.31
0.89	0.62	0.56	0.50	0.27	0.15	0.38	0.39
7.96	6.87	6.70	6.49	5.95	5.80	5.70	5.98
1.80	1.52	2.12	1.68	2.31	2.29	2.35	2.06
1.15	0.85	1.00	1.13	1.14	1.50	1.22	0.88
1.27	1.20	1.25	1.12	1.40	1.16	1.51	1.47
0.65	0.44	0.71	0.62	0.94	0.59	0.88	0.91
4.87	4.01	5.08	4.55	5.79	5.54	5.96	5.32
12.83	10.88	11.78	11.04	11.74	11.34	11.66	11.30
4.17	4.14	2.81	2.98	1.95	2.16	1.15	1.17
3.20	3.00	2.51	2.53	1.66	1.54	1.53	1.18
0.47	0.31	0.32	0.30	0.21	0.17	0.17	0.14
0.58	0.43	0.57	0.59	0.47	0.59	0.39	0.40
0.50	0.50	0.36	0.28	0.37	0.28	0.37	0.33
0.64	0.59	0.50	0.49	0.35	0.39	0.28	0.21
0.63	0.62	0.56	0.54	0.47	0.49	0.41	0.37
0.24	0.15	0.19	0.23	0.13	0.10	0.10	0.11
0.53	0.49	0.45	0.42	0.39	0.39	0.30	0.25
1.77	1.41	1.39	1.30	1.39	1.81	1.23	1.04
12.73	11.64	9.66	9.66	7.39	7.92	5.93	5.20
1.72	2.25	1.23	1.17	1.14	1.43	0.65	0.56
3.19	2.39	4.23	3.81	4.17	4.10	2.77	2.79
0.45	0.41	0.60	0.44	0.81	1.11	0.70	0.55
0.29	0.21	0.29	0.24	0.28	0.24	0.16	0.14
0.27	0.20	0.31	0.29	0.41	0.47	0.33	0.35
0.56	0.42	0.38	0.39	0.33	0.40	0.27	0.29
0.94	0.85	0.93	0.79	0.81	0.78	0.63	0.54
0.64	0.61	0.65	0.53	0.79	0.58	0.75	0.94
8.06	7.34	8.62	7.66	8.74	9.11	6.26	6.16

Meaning of Significant Facts

Significant Facts in these ratios are often particularly important statistics and ratios to printers. They are as meaningful as the financial statements, and often are the lowest common denominators which can be easily managed to produce higher profits.

Investment

The objective in this section is to present *assets used per employee*. From the facts on pages 20 and 21, you will note that High Profit companies generally invest more assets per employee. As sales volume increases, assets invested per employee also increase. Significant Facts related to investment are defined and explained below.

Assets per Employee — All Employees	=	$\frac{\text{Assets (Net)}}{\text{Number of All Employees}}$	=	This ratio includes all assets — current, fixed (net of depreciation), and others. It indicates the adequacy of the funds you employ.
Assets per Factory Employee	=	$\frac{\text{Assets (Net)}}{\text{Number of Factory Employees}}$	=	This ratio is similar to the one above, but shows assets per factory employee.
Average Net Worth per Employee	=	$\frac{\text{Shareholders' Equity}}{\text{Number of All Employees}}$	=	This figure tells what part of the first ratio (assets per employee) is funded by shareholders' investment.
Average Gross Plant Investment per Factory Employee	=	$\frac{\text{Plant Machinery andEquipment (Gross)}}{\text{Number of Factory Employees}}$	=	This is a "key fact." It is obvious that the trend is toward more equipment per factory employee.
Net Worth Percentage of Fixed Assets	=	$\frac{\text{Shareholders' Equity}}{\text{Fixed Assets (Net)}}$	=	This ratio indicates the relationship between funding fixed assets and shareholders' equity. Fixed assets should never be funded with current debt, but should be funded with long-term debt and shareholders' equity. This equity should also fund about 50 percent of all assets — an indication of funding strength.

Sales

The category of sales provides information on sales per employee. These statistics are determined twice — once including executives and then excluding them. Here, we will address statistics excluding executives. The following sales proportions are particularly noteworthy:

Sales per Employee	=	$\frac{\text{Sales}}{\text{Number of All Employees}}$	=	This is an invaluable number. The only better ones are the two ratios below.
Sales per Factory Employee	=	$\frac{\text{Sales}}{\text{Number of Factory Employees}}$	=	This is a refined number of sales produced per factory employee.
Sales Less Materials per Factory Employee	=	$\frac{\text{Sales Less Materials}}{\text{Number of Factory Employees}}$	=	This ratio is the Value Added produced per factory employee — one of the most important ratios in the Ratio Study. You must know this number and plan to improve it; the end result will be improved profit.

Employee Distribution

This category of Significant Facts presents the percentage distribution of employees by departments. For example, for all firms reporting in the PIA Ratio Study, the distribution is as follows:

Factory	74.82%
Administrative	14.55
Sales	10.63
	<u>100.00</u>

The most important fact here is the percentage of factory employees. Although there may be a firm with too many factory employees and not enough administrative and selling employees, this would be a rare exception. You need factory employees to produce your product; their productivity gives you your revenues.

Often, a very simple observation serves as an indicator of productivity; *i.e.*, are there enough factory employees to produce the product required to support the overhead and provide a profit. This seems elementary, in many cases, it's a revelation. Note that the percentage of factory employees is about 74 percent for very small firms, and rises to 83 percent of all employees for very large

firms. There is a specific characteristic for each sales class — a very simple, but valid relationship.

Sales Per Salesman

This ratio is computed as follows:

$$\frac{\text{Sales Produced by Sales People}}{\text{Number of Sales People}}$$

To use this fact properly, you must be very specific in taking into account your sales volume as well as your product and process specialties. Pages 20 and 21 show that sales per salesman in a small firm are about \$134,000 and that the figure rises to \$1,833,000 for firms with sales over \$10 million. This rise occurs throughout sales classes, and you must zero in on **your sales class** and **relate your figures to the product and process specialties** in the other PIA books in this series. Data for publications printing will be much different from that for commercial printing, and data from web-offset will be different from sheet-offset data.

Payroll

Payroll statistics are computed first by including fringe benefits and executive compensation, and then again by excluding these factors. Thus, there is a separate section within this category for executive payroll.

The first item in this category is total payroll as a percentage of sales. This includes factory, administrative and sales payroll, and is computed as follows:

$$\frac{\text{All Payroll Costs}}{\text{Sales}}$$

This ratio is affected by the size of a firm. Payroll as a percentage of sales in small firms starts at about 36 percent and decreases to about 33 percent for very large firms. The change is gradual, but significant.

The next ratio is factory payroll as a percentage of gross plant investment. It is computed as:

$$\frac{\text{Factory Payroll}}{\text{Machinery and Equipment (Gross)}}$$

In general, this ratio equals about \$1.00 per year in payroll costs per dollar of gross plant investment. This is a very qualitative statistic and the absolute number requires further evaluation. Of course, more than a 100 percent ratio would be better if the company were fully equipped. In this case, there would be a maximum utilization of equipment. However, it is still possible to have over a 100 percent ratio as the result of inadequate plant facilities. In other words, the number doesn't tell the full story.

Payroll per employee. This category provides an absolute amount of payroll per employee and, more specifically, per factory, administrative, and sales employee. These numbers are presented for "All Firms" and "Profit Leaders" in each sales class.

Note that, in some cases, **Profit Leaders pay less per employee.** One must put aside the notion that higher profit has to do with lower payroll costs. We have already established that Profit Leaders have a lower relative payroll cost, but that this is related to a higher capital investment per employee and a greater Value Added per factory employee.

A separate subheading in this category addresses payroll per executive for all employees, and then again, payroll broken down more specifically per factory, administrative, and sales executive.

Collection Period

The collection period of receivables is the time from sale to payment:

$$\frac{\text{Average Receivables}}{\text{Annual Sales}} \times 365 = \text{Collection Period of Receivables}$$

Receivables Turnover. Quite correctly, these sales are only credit sales, but in *printing*, credit sales are almost synonymous with sales. "Average receivables" is the sum of beginning of the year receivables and end of the year accounts receivable balances divided by two:

Accounts Receivable Beginning + Accounts Receivable Ending

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However, you can derive a better average if you use the beginning of the year balance plus the end of each month's balance and divide by 13. This produces your best average and, the better your average, the more accurate your collection period computation. Your ratio is indicative of your credit and collection policies. As it increases or decreases, your cash, receivables, payables, interest and other related accounts are all affected.

Most printing firms have about one-sixth of their annual sales in accounts receivable. For example, if your sales were \$1,200,000, you would have \$200,000 in accounts receivable. This would produce a real or imputed economic interest cost of at least \$30,000 a year. Any reduction in the collection period would reduce the portion of your assets in receivables and related interest costs. The faster the turnover, the sooner receivables turn into cash to pay liabilities, and the smoother your company operates.

Profit

Gross profit. Profit before taxes is generally determined before gross profit percentage is calculated. A printing company with a gross profit below 25 percent will rarely achieve a satisfactory net profit.

Gross profit percentage is computed as follows: first, determine your gross profit — sales less the cost of goods manufactured. Then relate gross profit to sales.

$$\frac{\text{Gross Profit}}{\text{Sales}} = \text{Gross Profit as a Percentage of Sales}$$

	All Firms		Profit Leaders
	All Firms		
Gross Profit as a Percentage of Sales	23.92%		28.40%

Smaller firms require a higher gross profit percentage. In firms with up to about \$5,000,000 in sales, the High Profit Standard is approximately 30 percent of gross profit. At that point, the gross profit required becomes less because of relatively lower administrative and selling expenses.

Too many printers are searching for a mystical formula to produce high profits. That formula need not be mystical, however, there really is a way to produce a higher gross profit. The difference in gross profits between "All Firms" and "Profit Leaders" approximates the difference in profit before taxes. Therefore, a source of higher profits is increasing gross profits. This directs us to:

- Pricing
- Material costing and control
- Increased value added per factory employee
- Expense control.

The average gross profit per factory employee is an excellent lowest common denominator with which to gauge your profit performance. It is computed as follows:

$$\frac{\text{Total Gross Profit}}{\text{Number of Factory Employees}} = \text{Average Gross Profit Per Factory Employee}$$

	All Firms		Profit Leaders
	All Firms		
Average Gross Profit per Factory Employee	\$23,137		\$27,503

Another interesting statistic is your average net profit before taxes per employee. For all firms, this figure is \$3,164 as compared to \$8,317 for Profit Leaders.

Income before taxes as a percentage of sales for all printing firms in the Ratio Study was 4.73 percent, compared with 12.15 percent for the Profit Leaders. The percentage for all firms is much too low; it returns a dismal 8.37 percent on investment. High Profit firms realize 17.23 percent return on investment.

Significant Facts

	ALL FIRMS REPORTING		SALES TO \$250,000		SALES FROM \$250,000-\$500,000	
	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
INVESTMENT						
Average assets per employee — All employees	\$ 31,079	\$ 36,472	\$ 22,914	\$ 23,139	\$ 20,439	\$ 21,561
Average assets per factory employee (Excluding Executives)	48,835	53,324	40,978	37,802	32,708	32,616
Average net worth per employee — All employees	13,116	19,762	6,699	10,466	7,859	10,976
Average gross plant investment per factory employee (Excluding Executives)	36,323	36,326	35,650	25,884	28,460	23,094
Net worth percentage of fixed assets	157.94%	231.16%	253.36%	495.00%	140.31%	236.97%
EMPLOYEES						
Percent factory — All employees	74.82%	76.66%	73.94%	79.66%	71.22%	76.52%
Percent administrative — All employees	14.55	13.43	19.23	14.39	21.35	17.29
Percent sales — All employees	10.63	9.91	6.83	5.95	7.43	6.19
SALES — VALUE OF PRODUCT PRODUCED INCLUDING EXECUTIVES						
Sales per employee — All employees	\$ 59,882	\$ 67,068	\$ 41,597	\$ 52,815	\$ 42,812	\$ 47,144
Sales per factory employee	84,885	90,080	61,411	72,680	61,774	62,872
Sales less material per factory employee	52,911	56,894	40,431	51,041	40,614	42,351
Sales per administrative employee	532,883	634,183	172,361	201,461	213,648	243,389
EXCLUDING EXECUTIVES						
Sales per employee — All employees	67,901	75,550	57,942	64,286	53,371	59,142
Sales per factory employee	94,872	97,786	78,028	81,302	69,459	70,254
Sales less material per factory employee	59,237	61,755	51,721	57,453	45,457	47,389
SALES PER SALESMAN	650,343	762,199	134,017	0	141,969	0
SALES TO CURRENT ASSETS	402%	365%	542%	477%	473%	447%
PAYROLL — INCLUDING TAXES AND BENEFITS INCLUDING EXECUTIVES						
Total payroll percentage of sales	39.44%	36.01%	36.45%	29.60%	40.41%	38.37%
Factory payroll percentage of gross plant investment	90.47	100.23	145.41	262.01	100.75	158.68
Payroll per employee — All employees	\$ 22,753	\$ 22,966	\$ 13,984	\$ 14,239	\$ 16,721	\$ 17,114
Payroll per factory employee	21,951	21,218	14,332	13,960	16,120	16,770
Payroll per administrative employee	26,175	27,125	10,530	10,095	17,795	17,247
Payroll per sales employee	31,737	34,566	7,306	6,245	11,552	11,483
PAYROLL — EXCLUDING TAXES AND BENEFITS EXCLUDING EXECUTIVES						
Payroll per employee — All employees	\$ 18,337	\$ 18,273	\$ 12,133	\$ 12,036	\$ 13,531	\$ 14,224
Payroll per factory employee	19,333	18,255	12,346	11,833	13,868	14,321
Payroll per administrative employee	14,167	13,843	6,455	5,955	10,555	10,467
Payroll per sales employee	25,173	25,937	2,687	1,649	7,516	8,804
EXECUTIVE PAYROLL						
Payroll per executive — All executives	39,294	42,520	12,426	11,526	21,301	20,450
Payroll per factory executive	26,128	28,464	10,346	9,313	12,726	16,755
Payroll per administrative executive	44,710	47,948	8,303	5,294	20,069	17,345
Payroll per sales executive	32,029	36,930	6,995	6,561	8,232	8,266
RECEIVABLES						
Collection period	57.7	57.2	51.7	40.8	48.6	51.8
PROFIT						
Gross profit percentage of sales	23.92%	28.40%	23.24%	30.34%	24.51%	26.71%
Average gross profit per factory employee	\$ 23,137	\$ 27,503	\$ 19,671	\$ 26,221	\$ 17,947	\$ 19,881
Income before taxes percentage of sales	4.73%	12.15%	5.28%	15.17%	4.03%	12.57%
Average income before taxes per employee	\$ 3,164	\$ 8,317	\$ 2,917	\$ 8,821	\$ 2,052	\$ 6,239

SALES FROM \$500,000-\$1,500,000		SALES FROM \$1,500,000-\$5,000,000		SALES FROM \$5,000,000-\$10,000,000		SALES OVER \$10,000,000	
ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
\$ 24,392	\$ 28,817	\$ 31,575	\$ 35,793	\$ 39,289	\$ 45,367	\$ 48,542	\$ 54,165
43,226	43,096	48,440	51,610	53,140	61,692	76,122	82,024
10,669	16,860	12,956	18,864	18,024	25,951	21,236	28,606
32,364	28,471	37,396	36,883	36,539	40,131	48,906	54,908
171.88%	227.78%	152.64%	227.85%	138.81%	197.92%	140.54%	164.84%
70.85%	71.92%	74.67%	75.13%	79.37%	77.88%	82.78%	83.86%
17.47	17.55	13.37	13.57	9.75	9.95	9.09	8.29
11.68	10.53	11.96	11.30	10.88	12.17	8.13	7.85
\$ 50,660	\$ 52,292	\$ 62,513	\$ 68,024	\$ 69,392	\$ 75,259	\$ 84,728	\$ 95,532
81,336	73,702	86,957	92,607	88,810	97,362	112,830	124,604
52,971	48,321	54,336	58,918	52,998	60,246	64,546	72,846
325,196	332,212	530,050	581,603	809,586	843,400	1,147,977	1,368,922
58,873	61,324	69,940	75,432	74,739	81,562	91,368	104,280
92,224	78,361	95,391	97,742	92,980	102,361	131,754	144,582
60,133	51,314	59,719	62,146	55,471	63,313	75,679	84,836
264,698	247,450	445,654	418,575	772,733	739,606	1,832,849	1,912,156
418%	351%	385%	366%	356%	310%	350%	340%
41.46%	38.52%	39.87%	36.21%	38.18%	36.21%	35.22%	33.06%
91.61	83.29	87.56	88.73	78.47	68.07	77.99	75.72
\$ 20,424	\$ 19,661	\$ 24,390	\$ 23,679	\$ 25,608	\$ 25,943	\$ 28,628	\$ 30,294
20,946	17,908	22,743	20,694	22,691	22,362	29,363	31,562
23,907	23,464	29,305	31,579	30,990	32,411	29,838	30,780
25,063	27,384	34,914	35,805	46,457	48,803	48,638	53,523
\$ 16,271	\$ 15,515	\$ 19,737	\$ 18,555	\$ 20,255	\$ 20,096	\$ 23,241	\$ 24,771
18,798	15,356	20,059	17,541	18,910	18,449	26,604	28,774
13,438	13,030	15,893	15,928	15,229	14,733	15,478	15,180
18,346	15,743	28,607	26,560	37,555	38,746	41,038	46,182
33,140	34,811	43,323	50,248	51,082	56,030	54,517	49,903
22,599	25,137	26,734	29,727	34,088	37,386	42,191	36,480
34,587	35,852	49,882	55,529	61,867	67,584	69,237	65,520
22,034	28,004	33,796	36,707	51,188	61,766	59,723	54,402
56.1	57.7	58.6	54.3	64.2	66.9	62.4	62.2
26.24%	30.60%	24.34%	29.95%	21.80%	27.68%	19.43%	23.30%
\$ 24,897	\$ 24,051	\$ 23,559	\$ 29,877	\$ 20,984	\$ 28,400	\$ 26,408	\$ 31,897
4.32%	11.76%	4.67%	12.47%	4.84%	11.14%	6.13%	11.57%
\$ 2,417	\$ 6,340	\$ 3,146	\$ 8,734	\$ 3,689	\$ 8,644	\$ 5,448	\$ 10,959

What Balance Sheet Ratios Show

A Statement of Financial Position

A balance sheet (statement of financial position) shows your assets, liabilities and shareholders' equity at a particular point in time. Shareholders' equity is the difference between assets and liabilities.

To many business managers, balance sheets are foreign and abstract. However, situations involving a printing company's financial position arise often enough that a good manager should have some understanding of the balance sheet and how it relates to company operations.

Your balance sheet is a clear indicator of your operational capability. With it, you can determine, for example:

- Sales per dollar of assets employed
- Sales and/or Value Added per dollar of gross plant investment employed
- Sales as a ratio to current assets
- Payroll as a percentage of factory assets.

These are only a few examples of the relationship between your balance sheet and operations. There are many more.

It is very important that your balance sheet reflects financial strength. Some say that doing business with other people's money, called "trading on equity" is good business. This is rarely true. If your current ratio is diminished by too much debt, the assets you need in the form of inventory, cash, etc. will not be available when you need them. Also, if you are working with an excessive amount of other people's money, a demand for repayment in cash can prevent you from investing current assets profitably in your business. It can prevent you from buying and discounting, and can affect your credit from financial institutions which, in turn, can deny you the purchase of fixed assets. Using a maximum of other people's money may look good on paper, but by doing so, you may never get to where you want to go.

In essence, of your total assets, 25 to 30 percent should be funded by current debt, about 20 percent by long-term debt, and the remaining 50 percent or so conservatively funded by shareholders' equity.

Analysis of Current Position

Proper makeup of your balance sheet is absolutely essential to profitable operations. The trading cycle, or flow of current assets, can be described as follows: a company starts with cash, and then purchases raw materials. An order requires that the cash and materials go into work in process inventory. When the job is finished, the work in process inventory becomes accounts receivable. Finally, the accounts receivable are converted back into cash and the cycle starts anew.

Therefore, let's start with an analysis of your working capital:

	Percent of Current Assets	
	All Firms	Profit Leaders
Cash	12.22%	18.50%
Receivables	55.69	50.64
Inventories	24.13	21.14
Other current assets	7.96	9.72
	<u>100.00</u>	<u>100.00</u>

Although the above table ignores the absolute amounts involved, which are significant, it appears that Profit Leaders have proportionately more cash and less receivables and inventory.

The current ratio is a key part of determining the adequacy of working capital. Current ratio is defined as:

		Current Ratio	
		All Firms	Profit Leaders
Current Ratio	= $\frac{\text{Current Assets}}{\text{Current Liabilities}}$	1.79	2.31

This is the most widely used ratio to test liquidity and debt-paying ability. In general, a ratio of 2.00 is assumed to be satisfactory. In the past, many firms functioned well with a lower ratio, but this is changing as companies are forced into longer conversion periods for inventories and longer collection periods for accounts receivable.

Current ratio may be improved by:

- Repaying current debt
- Converting current debt into long-term debt
- Converting non-current assets into current assets.

The quick ratio, sometimes called the acid test, is another analysis of working capital. It is determined by excluding inventories, which are least liquid assets, from current assets.

		Quick Ratio	
		All Firms	Profit Leaders
Current Assets Less Inventory	$\frac{\text{Current Assets Less Inventory}}{\text{Current Liabilities}}$	1.36	1.82

The minimum rule of thumb is a quick ratio of 1:1. Above, the ratio for "All Firms" is 1.36 and for "Profit Leaders," 1.82. In the quick ratio, you are looking to current assets for an immediate or near-term liquidation of current liabilities. Therefore, a qualitative review of current assets should be made to determine the realization point. For example, you may want to eliminate other current assets which may appear to be liquid but whose maturities are such that they should not be considered current assets for this purpose. A special caution here is that when inventories are very high, companies should check to see if there are sufficient funds with which to pay current liabilities.

Inventories

Inventories today require a more qualitative analysis than ever before. Partly, this is due to the fact that printers have to keep on inventory a greater quantity of paper. Today's turnaround time — from the time an order for paper is placed to the time the paper is on the floor — is so long that one may actually not complete a sale.

The second reason for a careful qualitative analysis of inventory is that the average printer has about half a month's sales in work in process inventory. This amount increases or decreases, depending on the market and process, but nevertheless, remains substantial. We have already determined that inventory represents 24.13 percent of current assets for "All Firms" and 21.14 percent for "Profit Leaders." In our analysis of current assets above, other helpful ratios are:

		All Firms	Profit Leaders
Inventory	=	0.55	0.37
Net Working Capital			

Net working capital is current assets less current liabilities.

		All Firms	Profit Leaders
Sales	=	14.33	15.70
Average Inventory	turnover	turnover	

This is not a true ratio of inventory turnover; a more accurate one would be:

$$\frac{\text{Materials used to manufacture product}}{\text{Average chargeable materials inventory}} = \text{Number of inventory turnovers per year}$$

$$\frac{365 \text{ days}}{\text{Number of inventory turnovers per year}} = \text{Average number of days inventory}$$

$$\frac{\text{Cost of product produced}}{\text{Average work in process inventory}} = \text{Work in process turnover}$$

$$\frac{365 \text{ days}}{\text{Work in process turnover}} = \text{Average number of days work in process}$$

The ratio of current debt to inventory determines the amount of equity that short-term creditors have in inventory.

	All Firms	Profit Leaders
$\frac{\text{Current Liabilities}}{\text{Average Inventory}}$	= 231%	205%

The Source of Funds

The balance sheet appears as follows:

Assets	Source of Assets
Current assets	Current liabilities
Fixed assets	Long-term liabilities
Other assets	Shareholders' equity

Assets are the funds we employ; they come from current liabilities, long-term debt and shareholders' equity. The proper makeup of these different kinds of assets is vitally important to an adequate balance sheet. An understanding of the different kinds of assets and their proportional relationship becomes critical as a printing business expands and, in particular, as new equipment is purchased. Although you may fund part of your current assets from current debt, a greater part should be funded by long-term debt and shareholders' equity.

Analysis of funding assets is as follows:

	All Firms	Profit Leaders
$\frac{\text{Current Liabilities}}{\text{Assets}}$	= 32.19%	25.71%
$\frac{\text{Long-Term Liabilities}}{\text{Assets}}$	= 25.63%	19.41%
$\frac{\text{Shareholders' Equity}}{\text{Assets}}$	= 42.18%	54.88%

Our conclusion is that "All Firms" are well financed, but "Profit Leaders" are better financed. The "All Firms" ratios, however, are not substandard.

We often hear the term "debt to equity" ratio. This is computed as follows:

	All Firms	Profit Leaders
$\frac{\text{Total Debt (Current + Long-Term Liabilities)}}{\text{Shareholders' Equity}}$	= 1.37	0.82

"All Firms" have 37 percent more debt than equity. On the other hand, "Profit Leaders" have 18 percent less debt than equity. This indicates that, in essence, printing firms should maximize shareholders' equity as a source of funds and maximize long-term debt as a source of debt.

Flow of Funds

The following ratios indicate a flow of funds, they include factors from both the operating statement and the balance sheet and give us a perspective of both.

The first ratio is profit as a percentage of working capital. It is computed as a percentage of working capital (current assets) and as a percentage of net working capital (current assets less current liabilities).

	All Firms	Profit Leaders
Working Capital:		
$\frac{\text{Income Before Taxes}}{\text{Current Assets}}$	16.64%	39.63%
Net Working Capital:		
$\frac{\text{Income Before Taxes}}{\text{Current Assets} - \text{Current Liabilities}}$	37.66%	69.91%

You can see from these ratios the effect that profit has on working capital. (Working capital is income before taxes although, in the real world, income taxes would necessarily reduce this amount.) If we could produce a "statement of changes," this income would flow directly into working capital. It would not be used to fund a long-term liability or the acquisition of other assets.

These ratios can be further refined to include depreciation as a source of funds. Although depreciation and amortization are charges on the operating statement, they are not applications of funds. An application of funds is made at the time of purchase, and generally accepted accounting principles provide a systematic write-off of the assets over their estimated useful lives.

	All Firms	Profit Leaders
Working Capital:		
$\frac{\text{Income Before Taxes} + \text{Depreciation}}{\text{Current Assets}}$	27.45%	49.74%
Net Working Capital:		
$\frac{\text{Income Before Taxes} + \text{Depreciation}}{\text{Current Assets} - \text{Current Liabilities}}$	62.10%	87.74%

Effect of Growth on the Balance Sheet

The balance sheet shows the financial structure in which a printing company is contained. Thus, there is a limit to the growth it will sustain. Assume the purchase of a \$500,000 press. As a result:

- Cash will be reduced by a down payment of, say, \$75,000.
- Fixed assets will increase by \$500,000.
- Current liabilities will increase to the extent of the related note payable that matures in the next 12 months.
- Long-term liabilities will increase by the amount of the remainder of the note payable for the purchase of the equipment.
- If we assume a 140 percent relationship of sales to fixed asset investment, we can anticipate an increase of \$700,000 in sales.
- These new sales will require about \$50,000 in inventory, which includes raw materials and work in process.
- As there will be a 60-day collection period, you will have approximately \$117,000 in accounts receivable.

Looking at a *pro forma* balance sheet, the changes are:

Cash	—	\$ 75,000
Accounts Receivable	+	117,000
Inventory	+	50,000
Machinery	+	500,000
Current Note Payable	+	95,000
Long-Term Note Payable	+	330,000

Any changes to produce growth, must be related to your balance sheet. A great deal of forethought must be given to determine whether the balance sheet can house that growth adequately. To think about it after the fact is too late.

Balance Sheet

	ALL FIRMS REPORTING		SALES TO \$250,000		SALES FROM \$250,000-\$500,000	
	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
ASSETS						
CURRENT ASSETS						
Cash	7.05%	10.98%	8.14%	12.38%	10.41%	13.30%
Receivables	32.12	30.06	26.49	27.68	30.69	33.30
Inventories	13.92	12.55	9.64	8.79	10.62	7.21
Other current assets	4.59	5.77	4.71	7.11	4.26	6.76
TOTAL CURRENT ASSETS	57.68	59.36	48.98	55.96	56.08	60.57
FIXED ASSETS						
Real estate	9.59	10.47	8.44	5.00	7.19	9.17
Less: Accumulated depreciation	2.73	2.75	2.19	1.34	2.08	2.60
	6.86	7.72	6.25	3.66	5.11	6.57
Machinery and equipment	61.44	54.06	65.75	57.14	75.14	60.35
Less: Accumulated depreciation	33.48	28.41	30.51	26.76	43.31	34.00
	27.96	25.65	35.24	30.38	31.83	26.35
Other fixed assets	6.88	6.16	9.31	9.67	8.70	5.01
Less: Accumulated depreciation	3.43	2.93	3.64	1.87	4.87	2.45
	3.45	3.23	5.67	7.80	3.83	2.56
NET FIXED ASSETS	38.27	36.60	47.16	41.84	40.77	35.48
OTHER ASSETS	4.05	4.04	3.86	2.20	3.15	3.95
TOTAL ASSETS	100.00	100.00	100.00	100.00	100.00	100.00
LIABILITIES AND EQUITY						
CURRENT LIABILITIES						
Notes payable	8.50	5.41	9.82	10.97	7.97	3.80
Accounts payable	14.35	10.85	14.58	9.77	15.12	11.07
Other current liabilities	9.34	9.45	6.88	7.10	8.48	10.03
TOTAL CURRENT LIABILITIES	32.19	25.71	31.28	27.84	31.57	24.90
LONG-TERM LIABILITIES	25.63	19.41	34.49	27.02	30.67	23.07
TOTAL LIABILITIES	57.82	45.12	65.77	54.86	62.24	47.97
SHAREHOLDERS' AND PROPRIETORS' EQUITY	42.18	54.88	34.23	45.14	37.76	52.03
TOTAL LIABILITIES AND EQUITY	100.00	100.00	100.00	100.00	100.00	100.00

Balance Sheet Ratios

CURRENT RATIO	1.79	2.31	1.57	2.01	1.78	2.43
QUICK RATIO	1.36	1.82	1.26	1.69	1.44	2.14
TOTAL LIABILITIES TO EQUITY	1.37	0.82	1.92	1.22	1.65	0.92
LONG-TERM LIABILITIES TO EQUITY	0.61	0.35	1.01	0.60	0.81	0.44
ACCUMULATED DEPRECIATION - MACHINERY AND EQUIPMENT TO TOTAL MACHINERY & EQUIPMENT	0.54	0.53	0.46	0.47	0.58	0.56

SALES FROM \$500,000-\$1,500,000		SALES FROM \$1,500,000-\$5,000,000		SALES FROM \$5,000,000-\$10,000,000		SALES OVER \$10,000,000	
ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
8.48%	14.22%	6.45%	11.25%	6.38%	10.99%	3.01%	3.90%
33.46	30.32	32.93	29.55	31.61	29.33	30.75	30.34
12.58	9.73	14.50	14.20	16.06	14.14	17.43	16.35
4.63	5.51	4.52	6.17	4.23	4.27	5.28	5.69
59.15	59.78	58.40	61.17	58.28	58.73	56.47	56.28
6.34	7.68	10.05	10.78	13.17	14.08	14.06	12.87
1.71	1.63	3.09	3.24	3.37	3.34	3.97	3.33
4.63	6.05	6.96	7.54	9.80	10.74	10.09	9.54
63.47	54.55	60.49	54.60	53.64	47.79	54.40	53.58
35.28	27.41	33.34	30.83	28.62	25.55	27.58	24.75
28.19	27.14	27.15	23.77	25.02	22.24	26.82	28.83
7.46	6.11	7.25	7.39	5.28	5.93	3.46	3.21
3.63	3.06	3.78	3.95	2.54	2.78	1.47	1.56
3.83	3.05	3.47	3.44	2.74	3.15	1.99	1.65
36.65	36.24	37.58	34.75	37.56	36.13	38.90	40.02
4.20	3.98	4.02	4.08	4.16	5.14	4.63	3.70
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
9.07	4.94	8.92	5.30	7.52	3.46	6.83	7.18
15.30	10.07	13.78	11.68	14.54	10.37	13.09	11.01
7.63	5.91	10.48	11.14	10.09	10.08	10.42	10.64
32.00	20.92	33.18	28.12	32.15	23.91	30.34	28.83
24.96	21.56	25.51	18.39	22.56	17.22	22.58	15.35
56.96	42.48	58.69	46.51	54.71	41.13	52.92	44.18
43.04	57.52	41.31	53.49	45.29	58.87	47.08	55.82
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

1.85	2.86	1.76	2.18	1.81	2.46	1.86	1.95
1.46	2.39	1.32	1.67	1.31	1.86	1.29	1.39
1.32	0.74	1.42	0.87	1.21	0.70	1.12	0.79
0.58	0.37	0.62	0.34	0.50	0.29	0.48	0.27
0.56	0.50	0.55	0.56	0.53	0.53	0.51	0.46

Return on Investment

Return on Investment (ROI) refers to the capital used to produce income. Mathematically, it is:

$$\frac{\text{Income}}{\text{Assets}} = \text{Return on Investment (ROI)}$$

ROI-1982 Ratios: All Firms - 8.57%; Profit Leaders - 17.23%

Return on Investment (ROI) is the most comprehensive measure of profitability. The only difference of opinion in this area is whether net assets or gross assets should be used to compute ROI (see discussion on page 28).

ROI is a very simple computation, analogous to figuring simple interest, or, in introducing a time element involving alternate decisions and capital expenditures, or compound interest.

The ROI concept is gaining more and more acceptance as a measure of profitability in printing companies. This is due to the fact that printing is a capital intense industry and printing firms generally have high fixed assets against which their profit performance is measured.

The importance of ROI is evident from its history in the printing industry. Since ROI was introduced in the 1967 PIA Ratio Books, the Individual Computer Printout has been expanded to include ROI, an entire annual PIA financial meeting has been devoted to the concept, and PIA conducted a special historical case study on ROI. This study revealed a decline in investment turnover and showed the effect of this on the ROI rate when there is not a corresponding increase in profit as a percentage of sales.

PIA has remained a strong advocate of the ROI concept and consistently urges its adoption through continuing education.

Defining Return on Investment

As stated above, ROI can be expressed simply as:

$$\frac{\text{Income}}{\text{Assets}} = \text{Return on Investment}$$

This ratio produces, as a percentage, an annual rate of return on assets used to produce income. It is the same as an annual interest rate that one would receive on a bond or other type of investment.

The simple ROI formula is a reduction of the following ratios:

$$\frac{\text{Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} = \text{ROI}$$

The first fraction is income as a percentage of sales shown on pages 14 and 15 of this study. It is a hard number, therefore, if you want to improve your ROI, it is this percentage to which you must pay particular attention. We will discuss this further under the heading "Return-on-Investment Dilemma."

The second fraction is called "investment turnover" or "asset turnover." The term "investment" in this context refers to assets used to produce more earnings.

The "sales" in the denominator of the term "income as a percentage of sales" and the "sales" in the numerator of the term "investment turnover" can be cancelled. We have already done this in order to obtain the simple expression "Income over Assets." However, it is still best to think of these two fractions as dynamic elements in ROI management.

Here is an example of the ROI computation:

Sales			\$1,000,000	
Profit Before Taxes			120,000	
Assets			500,000	
$\frac{\$120,000 \text{ Income}}{\$1,000,000 \text{ Sales}}$	x	$\frac{\$1,000,000 \text{ Sales}}{\$500,000 \text{ Assets}}$	=	ROI
12%	x	2	=	24% ROI

In the PIA Ratios, income is . . .

. . . income **before** interest expense, other income and taxes.

Assets are . . .

. . . gross assets employed **before** deduction of accumulated depreciation and amortization.

As these are not necessarily commonly used definitions, we will discuss other concepts as well.

Alternate Concepts

Net Profit Before Taxes. Our terminology refers to income as income before interest, other income and taxes. Most published studies base Return on Investment on after-tax profit. The reasoning is that taxes are expenses, just like any other expenses.

However, for our purposes, computing Return on investment before taxes provides a standard which everyone can easily use. The amount of tax is different for almost everyone since:

- The normal tax rate is different at different income levels.
- Investment credits, new-job tax credits and other credits can produce substantially different net taxes.
- This year's tax may be reduced by a net operating loss carry-forward.
- Most taxpayers use accelerated depreciation methods for tax purposes, and straight-line for financial purposes.

The tax on profits may vary widely from situation to situation. Thus, if Return on Investment is to be of practical use, computing it on profit before taxes is the more valid standard.

Interest Expense, Non-Operating Income and Expense. By using profit before interest expense, we are able to compare the Return on Investment before an interest charge vs the cost of capital, which is an interest charge.

For example, if your return on investment is 25 percent and your cost of interest is 17 percent, it pays to borrow funds which will produce a greater return. By the same token, it would not pay to borrow funds at an interest rate greater than your ROI. You can see that, if interest were deducted from profit, it would not be valid to compare your return on investment with the cost of capital to determine whether a ROI decision is valid.

Non-operating income and expenses normally are excluded from our calculations. It is important that you remove non-operating assets from your investment figure as well.

Depreciation

Since accumulated depreciation is not deducted from fixed assets in arriving at total investment or assets, there are some proponents of the theory that depreciation not be deducted from income for ROI purposes. This concept is not too strongly advocated.

Some printers, for financial reasons, compute depreciations by accelerated depreciation methods. This produces higher depreciation in the early years of an asset's life than does the straight-line method. Where accelerated depreciation is used, the excess depreciation should be added back to profit in order to compute your ROI.

Valuation of Assets

We can consider four different asset-valuation bases:

- **Gross Assets at Book Value** - Assets are at their original cost without deduction for accumulated depreciation.
- **Net Book Value** - Assets are valued at original cost less accumulated amortization and depreciation.
- **Replacement Value** - This is the same as Gross Assets, but adjusted for the increase in their replacement cost.

- **Market or Actual Cash Value** - Similar to Net Book Value, but asset costs have been changed to reflect replacement cost less the proportional accumulated depreciation.

All of these variations present ways of valuing fixed assets. Each approach has considerable merit. The Replacement Value and the Replacement Value less Accumulated Depreciation are approaches you may want to use on your own as they can be very meaningful depending on your circumstances and objectives. In these PIA Ratio Studies, however, we are limited to determining ROI by Gross Assets at cost and Net Book Value.

Return on Investment Dilemma

Since ROI is computed by multiplying "income as a percentage of sales" by the "investment turnover," it would appear that we could increase our ROI by one or the other factor, or both. This is true, but first a little background is necessary. We will limit our statistics to the Profit Leaders.

The investment turnover for Profit Leaders in this year's Ratio Study is 141.56 percent. This means that these firms achieved \$1.42 in sales for each \$1.00 of assets employed. Let's look at the historical record of investment turnover.

This year	141.56%
1981	142.49
1980	141.42
1979	138.31
1978	141.33

Throughout these years, investment turnover has remained fairly steady. This has been true for all participants. At the same time, however, a specific printing company that acquires substantial new equipment is likely to show a decline in investment turnover. This is caused by the capital intensity of printing equipment. Therefore, to maintain a fair return on investment, profit as a percentage of sales has to be increased. This can best be explained with an example:

	Old	New
Equipment	\$50,000	\$200,000
Investment Turnover	200%	140%
Desired Return on Investment	20%	20%

Return on Investment = Investment Turnover x Profit as % of Sales.

			Profit Needed
ROI =	Sales Assets	x	Income Sales
Old 20% =	100,000 50,000	x	10,000 100,000
New 20% =	280,000 200,000	x	40,000 280,000
			14.3%

To maintain the desired 20 percent Return on Investment, one would need a profit of 14.3 percent profit on sales with the new equipment, as opposed to a 10 percent profit on sales with the old equipment.

There are two traps to avoid in the area of Return on Investment:

1. When you increase the assets you employ, you must also increase your profit as a percentage of sales to maintain a fair return on investment. If you don't, you risk having a diminished Return on Investment.
2. Your new selling price with a higher profit mark-up may still be lower than your price using the old equipment. The new equipment should produce a lower unit selling price despite the higher cost rates and higher required margin. If this were not true, there would be no economic justification for replacing old (less capital intense) with new (more capital intense) equipment.

In conclusion, concentrate on profit as a percentage of sales. Moreover, don't let this profit percentage be trite. Let it vary with the intensity of assets employed. And remember, make every effort to maximize investment turnover.

Turnover

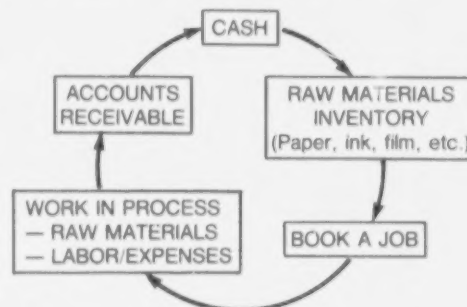
Throughout this discussion, we have emphasized the printing industry's low Return on Investment; this year the average for "All Firms" was only 8.37 percent. A key factor in this poor profit performance is the **failure to maximize turnover** in the capital cycle.

Turnover is defined as the period of time that it takes to complete the entire capital cycle. It is computed as:

	Turnover	
	All Firms	Profit Leaders
Cost of Goods Sold Working Capital	2.66	2.34

Significantly, optimum turnover provides a maximum of profit with use of a minimum of assets - thus it yields a maximum Return on Investment.

The capital cycle is simply a series of sequential conversions - cash to inventories to accounts receivable and back to cash. For printers, schematically this cycle is as follows:



The cycle starts with your cash, a portion of which goes into materials inventory. When you book a job, you use additional cash for raw materials, labor and other expenses (work in process inventory). Then, the completed job moves into accounts receivable. Finally, accounts receivable are converted back to cash - hopefully, more cash than you had in the beginning.

By minimizing the required time in each step of the cash cycle, you affect more cycles per year - and more profit is generated with a given commitment of funds. Thus you are maximizing your return on investment.

Optimizing your turnover is in keeping with sound accounting principles, but appears to be in conflict with some printers' practices. Too often, production, estimating and sales seek extra time to do a job - even though the faster the job is done, the better the turnover position. If management is to improve its return on investment, it must insist that the capital cycle be completed as quickly as possible.

Here is a situation that illustrates a common mistake among printers that reduces turnover and, in turn, their return on investment: a printer instructed his sales people that the longer the time from the date of an order to its delivery, the greater the discount to the purchaser.

This policy is contrary to improving turnover and achieving a better return on investment. With a lower selling price, it is equivalent to "heads you win and tails I lose." Both aspects are contrary to your objective.

However, such a printing policy does enable printers to accomplish two things: (1) it permits smoothing out production since delaying a job provides greater scheduling flexibility, and (2) printers can book a lot of business that they would not otherwise have.

Despite these factors, though, the end result of this policy will be a lower Return on Investment.

Cash Turnover

How quickly you complete the capital cycle depends on how much cash you have in the beginning. Neither too much nor too little is desirable. For example, if \$100,000 is the right amount and you

have more than that, the following three things are likely to occur:

1. Your cash will not turn over; it will just lay in place.
2. It will finance higher inventories (less inventory turnover) or go into other operating assets in higher amounts than are necessary.
3. It may actually slow your receivable collections. When you don't appear to need cash, you are less strict about collections.

$$\frac{\text{Sales}}{\text{Average Cash Balance}} = \text{Cash Turnover}$$

	<u>All Firms</u>	<u>Profit Leaders</u>
Cash Turnover	29 times	17 times

Inventory Turnover

You have three basic types of inventories that require analysis:

1. Departmental Supplies
2. Chargeable Materials (paper, ink, film, plates and others)
3. Work in Process

The above is an important part of the capital cycle. On page 22, under "Analysis of Current Position", inventories represent 24.13 percent (All Firms) and 21.14 percent (Profit Leaders) of working capital.

Departmental Supplies. Although not an important factor in the capital cycle, departmental supplies should not be ignored. The level of supplies should be controlled to minimize your capital investment, while meeting your need for uninterrupted production.

$$\frac{\text{Departmental Supplies Used}}{\text{Average Departmental Inventory}} = \text{Supplies Turnover}$$

Chargeable Materials represent a much more substantial part of inventory turnover. Your turnover improves when you optimize inventory levels and reduce the storage time of materials (primarily paper) prior to production.

$$\frac{\text{Paper Used}}{\text{Average Paper Inventory}} = \text{Paper Inventory Turnover}$$

$$\frac{\text{Other Chargeable Materials Used}}{\text{Average Other Chargeable Materials Inventory}} = \text{Other Chargeable Inventory Turnover}$$

Work in Process. This offers the greatest opportunity to improve turnover. The faster a job is shipped out of your plant, the greater your profit potential and the more beneficial the effect on your capital position. You profit in two ways: you spend less time on a job and tie up less cash in inventory. At any one time, work in process may represent up to two months in sales. This should be ample incentive to shorten your work in process time in every way possible.

$$\frac{\text{Cost of Product Produced}}{\text{Average Work in Process Inventory}} = \text{Work In Process Turnover}$$

Accounts Receivable Turnover is the time between billing and collection. According to this Ratio Study, the collection period for "All Firms" is 57.7 days. Clearly, this period is too long; it can be reduced by tightening credit and collection procedures. You may lose some accounts but, in my experience, you will profit in the long run by shortening your collection period.

$$\frac{\text{Sales}}{\text{Average Accounts Receivable}} = \text{Accounts Receivable Turnover}$$

Wasted Time

Our diagram of the capital cycle shows no step between work-in process and the job's conversion to accounts receivable. Too often, there is an intermediate step which we call "**Wasted Time.**" **This is the period between the time a job is finished and it is billed.**

Over the years, I think I have heard every possible reason for not billing a job as soon as it is finished - incomplete cost records, bills to come from suppliers, and many other excuses. As an accountant, I must call these excuses and not reasons. None are valid reasons for delayed billings. This is one expense you do not need and can easily avoid.

Net Assets vs Gross Assets

In comparing Return on Investment computed on Gross vs Net Assets, we find that each produces substantially different results. For a number of years, the PIA Ratio Study has been computing ROI based on Gross Assets. This is the so-called DuPont method, which has the advantage of alerting management to a decreasing Return on Investment and the need for equipment replacement.

Under the Net Asset method, a higher Return on Investment may justify continued investment in existing equipment mainly because of lower book value. The Gross Asset basis has its purpose, but is not as accurate as the Net Book Value.

The Return on Investment based on Net Assets is computed as follows:

$$\frac{\text{Income Before Taxes, Interest, and Other Income or Expense}}{\text{Assets Less Accumulated Depreciation}}$$

For "All Firms," this is 18.05 percent; for "Profit Leaders," 32.68 percent.

This method may produce a more valid operational Return on Investment, and a more accurate interest computation.

What Is a Fair ROI?

The "All Firms" ROI of 8.37 percent on gross assets and 18.05 percent on net assets is hardly adequate to justify investment. The "Profit Leaders" ROI is 17.23 percent on gross assets and 32.68% on net assets. The high-profit companies appear to achieve an ROI more commensurate with the economic risk.

The printing industry presents substantial risk and, therefore, the return related to that risk should be substantially higher than prevailing interest rates. Thus, your ROI should exceed 20 percent on a new-asset venture, or 30 percent on net assets.

Your Ultimate Goal: Thinking ROI

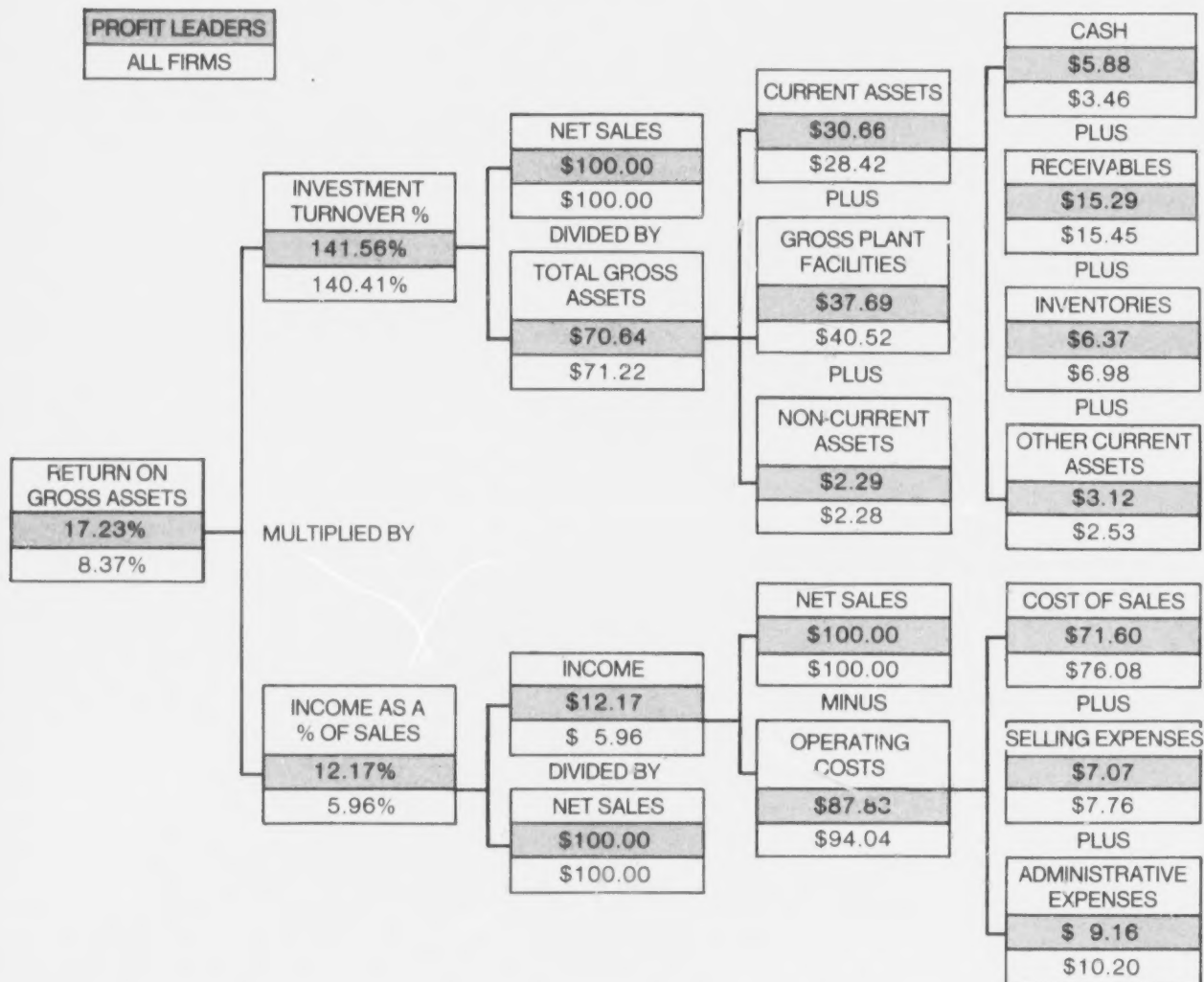
Thinking ROI is like working backwards. Thus, a competent printing manager might plan along these lines:

1. Capital to be employed	\$400,000
2. Desired ROI: 20 percent of capital employed	80,000
3. Sales to be achieved from new assets employed: 140 percent	560,000
4. Required profit as a percentage of sales:	$\frac{\$ 80,000}{\$560,000} = 14.3\%$

This example shows that you must strive for a 14.3 percent profit on sales to produce a 20 percent ROI on the capital you employ. Think ROI — and profit.

Return on Investment (ROI) Chart — All Printers

RETURN ON INVESTMENT CHART—BASE: \$100 OF SALES



Return on Investment—Per \$100 of Sales

	ALL FIRMS REPORTING		SALES TO \$250,000		SALES FROM \$250,000-\$500,000	
	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
INVESTMENT						
Current Assets:						
Cash	\$ 3.46	\$ 5.88	\$ 4.64	\$ 5.78	\$ 4.28	\$ 5.99
Receivables	15.45	15.29	13.94	11.00	13.04	13.93
Inventories	6.98	6.37	5.91	3.76	5.16	3.01
Marketable securities	0.92	1.58	0.13	0.04	0.74	1.60
Other current assets	1.61	1.54	2.30	3.43	1.61	1.71
	28.42	30.66	26.92	24.01	24.83	26.24
Plant Investment:						
Land and building	6.94	6.33	26.76	3.74	4.89	5.07
Machinery and equipment	30.31	28.29	33.76	24.64	33.36	26.53
Other fixed assets	3.27	3.07	5.10	3.22	3.77	2.33
	40.52	37.69	65.62	31.60	42.02	33.93
Non-Current Assets	2.28	2.29	1.51	0.95	1.92	2.23
TOTAL INVESTMENT	71.22	70.64	94.05	56.56	68.77	62.40
INVESTMENT TURNOVER PER \$100 OF SALES	140.41%	141.56%	106.33%	176.80%	145.41%	160.26%
EARNINGS						
Cost of Product	\$76.08	\$71.60	\$76.76	\$69.66	\$75.49	\$73.29
Selling Expenses	7.76	7.97	5.14	4.00	5.59	4.70
Administrative Expenses	10.20	9.16	11.34	8.95	13.56	10.60
	94.04	87.83	93.24	82.61	94.64	88.59
Income Before Interest, Other Income, and Taxes	5.96	12.17	6.76	17.39	5.36	11.41
RETURN ON INVESTMENT — INVESTMENT TURNOVER x INCOME	8.37%	17.23%	7.19%	30.75%	7.79%	18.29%

SALES FROM \$500,000-\$1,500,000		SALES FROM \$1,500,000-\$5,000,000		SALES FROM \$5,000,000-\$10,000,000		SALES OVER \$10,000,000	
ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS	ALL FIRMS	PROFIT LEADERS
\$ 4.12	\$ 7.93	\$ 3.19	\$ 6.00	\$ 3.45	\$ 6.33	\$ 1.65	\$ 2.33
15.02	15.49	15.68	14.46	17.07	17.90	16.58	16.56
6.07	5.08	6.99	6.69	8.59	8.16	9.30	8.82
0.81	1.69	1.01	1.62	0.85	1.41	1.50	2.19
1.51	1.60	1.39	1.34	1.77	1.23	2.14	1.31
27.53	31.79	28.26	30.11	31.73	35.03	31.17	31.21
4.22	5.32	6.10	6.07	7.85	9.03	8.17	7.26
29.28	29.19	30.07	27.73	29.35	28.02	30.24	31.21
3.33	2.83	3.41	3.90	2.91	3.48	1.83	1.63
36.83	37.34	39.58	37.70	40.11	40.53	40.24	40.10
2.09	2.14	2.16	2.14	2.69	3.17	3.29	2.47
66.45	71.27	70.00	69.95	74.53	78.73	74.70	73.78
150.49%	140.31%	142.86%	142.96%	134.17%	127.02%	133.87%	135.54%
\$73.76	\$69.40	\$75.66	\$70.05	\$78.20	\$72.32	\$80.57	\$76.70
8.06	7.34	8.62	7.66	8.74	9.11	6.26	6.16
12.73	11.64	9.66	9.66	7.39	7.92	5.93	5.20
94.55	88.38	93.94	87.37	94.33	89.35	92.76	88.06
5.45	11.62	6.06	12.63	5.67	10.65	7.24	11.94
8.20%	16.30%	8.66%	18.06%	7.61%	13.53%	9.69%	16.18%

Absolute Data

	NUMBER OF PARTICIPATING FIRMS	AVERAGE FIRM REPORTING**		
		TOTAL ASSETS	SALES OR VALUE OF PRODUCTION	TOTAL INCOME
TOTAL - ALL PRINTING FIRMS	944	\$ 2,673,000	\$ 4,887,000	\$ 278,000
TOTAL - PROFIT LEADERS*	238	3,252,000	5,755,000	668,000
BY SIZE OF FIRM:				
ALL FIRMS				
0-\$250,000	45	121,000	175,000	9,000
\$250,000-\$500,000	95	175,000	370,000	15,000
\$500,000-\$1,500,000	235	468,000	964,000	41,000
\$1,500,000-\$5,000,000	348	1,473,000	2,895,000	133,000
\$5,000,000-\$10,000,000	117	3,879,000	6,955,000	333,000
Over \$10,000,000	104	13,696,000	24,249,000	1,590,000
PROFIT LEADERS				
0-\$250,000	15	78,000	176,000	27,000
\$250,000-\$500,000	24	178,000	388,000	49,000
\$500,000-\$1,500,000	49	511,000	920,000	109,000
\$1,500,000-\$5,000,000	75	1,447,000	2,756,000	340,000
\$5,000,000-\$10,000,000	39	4,041,000	6,760,000	759,000
Over \$10,000,000	36	13,261,000	23,397,000	2,694,000

*"Profit Leaders" are those firms which earned 8% or greater pretax profits on sales.

**Unlike the ratios shown in this book, these figures are arithmetic averages. See explanatory note on Page 3.